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IMMEDIATE RESPONSE ACTION PLAN

MURPHY'S WASTE OIL SERVICE, INC.
252 SALEM STREET
WOBURN, MASSACHUSETTS

DEP RTN #3-22144

Prepared for:

Murphy's Waste Oil Service, Inc.
252 Salem Street
Woburn, MA 01801

Prepared by:

Clean Harbors Environmental Services, Inc.
392 Libbey Industrial Parkway
Weymouth, Massachusetts 02189

November 22, 2002

Superfund
SITE: Wells G&H OU
BRANCH: 2
CHES Job No. EN183180 OTHER: 457911

Lisa McNeil
Project Scientist

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Senior Project Manager

IMMEDIATE RESPONSE ACTION PLAN

MURPHY'S WASTE OIL SERVICE, INC.
252 SALEM STREET
WOBURN, MASSACHUSETTS

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IMMEDIATE RESPONSE ACTION PLAN

Murphy's Waste Oil Service, Inc.
252 Salem Street
Woburn, Massachusetts

INTRODUCTION

This Immediate Response Action (IRA) Plan has been prepared by Clean Harbors Environmental Services, Inc. (CHES) to document response actions relative to the presence of separate-phase oil discovered in two monitoring wells at the Murphy's Waste Oil Service, Inc. (Murphy's) facility located at 252 Salem Street in Woburn, Massachusetts (the "site"). The site is owned by Old Oil Realty Trust and is leased by Murphy's, a transfer, storage, and disposal facility for waste oil. Figure 1 shows the location of the site. An IRA Transmittal Form (BWSC-105) to accompany this Plan is presented in Appendix A.

SUMMARY OF CORRECTIVE ACTION

An initial Hydrogeologic Characterization Report, dated February 1, 1994, was prepared by CHES and submitted to DEP to document three subsurface investigations which were performed on the site by CHES between December 1987 and February 1989. The Hydrogeologic Characterization Report included results of the previous investigations, a summary of the geology and hydrogeology of the site area, and descriptions of pertinent site features.

The Hydrogeologic Characterization Report also included information on two areas of the site known to have been impacted by petroleum. One area of impact had been identified in the northern portion of the site where twelve aboveground storage tanks were formerly located. The second area of impact was in the central portion of the site which was used in the 1950's for disposal of spent silica media previously used to filter waste oil. Separate-phase oil was not disposed with the spent filter media because it had

resale value. As described in the Hydrogeologic Characterization Report, a Short-Term Measure was performed in March and April 1989 to remove petroleum-impacted soil prior to construction of the building. Shallow unimpacted soils were stripped off and segregated, and approximately 1,100 cubic yards of the deeper oil-contaminated filter media and soils were excavated and disposed. The completed excavation extended to a depth of at least seven to eight feet below grade over the footprint area of the facility building.

A Scope of Work for Subsurface Investigation, dated June 30, 1994, was subsequently prepared to address requirements of Section 10.b.1 of the RCRA Part B Permit. The Scope of Work incorporated information from the report, Draft Remedial Investigation, Southwest Properties, Wells G&H Superfund Site, Woburn, Massachusetts, which was prepared by Remediation Technologies, Inc. (ReTec) for Beatrice Corporation in February 1994. The Murphy's site is located in the southwest corner of the area under investigation for the Central Area Remedial Investigation/Feasibility Study of the Wells G&H Site. An Addendum I to Hydrogeologic Characterization Report (Addendum), dated January 31, 1995, was prepared by CHES and submitted to DEP to summarize findings of the ReTec investigation as they relate to the Murphy's site and to document additional investigation which was performed in accordance with the Scope of Work.

In a letter dated May 1, 1995, DEP determined that a Corrective Action Investigation was required on the Murphy's site. A Corrective Action Investigation was subsequently implemented during the period of October 1995 through March 1996 (Part I CAI). Results of the investigation were documented in the Corrective Action Investigation Report (CARP [Part I]), dated April 15, 1996. Based on findings of the Part I CAI, the DEP required that additional assessment be performed to further delineate the extent of contamination. To address this requirement, a Part II Corrective Action Investigation (Part II CAI) was implemented during the period of October 1997 through January 1998, the results of which were documented in the CARP (Part II) report, dated March 16, 1998. Figure 2 shows the locations of soil borings and monitoring wells installed during the Corrective Action Investigation. Figure 3 shows cross-sections showing the extent of petroleum impacts in the northern and central portions of the site.

Pursuant to requirements of the RCRA Part B Permit issued to Murphy's, a Groundwater Monitoring Plan (GMP), dated April 8, 2002, was developed and submitted to the DEP. The GMP included results of additional assessment used to develop the Plan. Specifically, a comprehensive gauging event was performed on November 5, 2001 of 37 monitoring wells on the Murphy's property. A summary of the gauging data is presented as Table 1. As shown in Table 1, separate-phase oil was detected in well MW-7 (0.24 foot), MW-16 (0.44 foot), and MR-2SS (0.01 foot). The separate-phase product was considered reflective of historic contamination at the site which was the subject of the Corrective Action Investigation. Therefore, the gauging results were documented in the GMP consistent with the manner of previous reporting of site conditions at Murphy's.

On August 26, 2002, the DEP Bureau of Waste Prevention issued a Notice of Noncompliance (NON) to CHES (the parent company of Murphy's) for failure to report a release condition to the DEP Bureau of Waste Site Cleanup. Specifically, the measured thickness of oil in wells MW-7 and MW-16 exceeded the 72-hour notification requirement for liquid non-aqueous phase liquid (LNAPL) accumulation greater than ½-inch on groundwater in a monitoring well. A copy of the NON is included in Appendix B.

IMMEDIATE RESPONSE ACTION

Immediate Response Action Approval

Per the NON, notification was made to the DEP Northeast Regional Office (NERO) at 9:38AM on September 25, 2002. Mr. Roger Chu of the DEP received the call and issued Release Tracking Number (RTN) 3-22144 to the new site condition. The Release Notification Form (BWSC-103) was previously submitted to the DEP, and a copy of the form is included in Appendix C.

Mr. Chu gave verbal approval to conduct an Immediate Response Action (IRA) to address the LNAPL in the two wells. The verbally-approved tasks under the IRA include gauging of LNAPL thickness in the wells, initially on a semi-monthly basis, and removal of LNAPL when it is encountered. The initial semi-monthly gauging frequency is intended to determine if LNAPL persists in wells MW-7 and MW-16, or if the occurrence was due to the low water table resulting from regional drought conditions. The IRA approval also included sampling of separate-phase petroleum from wells MW-7 and MW-16 for analysis to identify the petroleum type.

Status of Immediate Response Action

Wells MW-7 and MW-16 were gauged and then purged on four dates since release notification was made. Product thickness was measured using an electronic oil/water interface probe. Oil was purged from the wells after gauging using a polyethylene bailer. The oil is being accumulated in a dedicated drum staged at the site. Table 2 presents a summary of the gauging data. Product thickness has been observed to decrease in both wells since the initial event on September 30. As of the last gauging event, 0.21 foot of product was detected in MW-16, and no measurable LNAPL was found in MW-7. During each gauging event, the adjacent wetland was checked for the possible presence of an oil sheen. Water was not present in the wetland during the first two site checks. Water was present during the latter two site checks, with no sheen observed.

During the first gauging event on September 30, 2002, samples of LNAPL were collected from wells MW-7 and MW-16 for laboratory analysis of PCBs (by EPA Method 8082) and total petroleum hydrocarbon (TPH by GC/FID) to identify the

petroleum type. The analytical results are presented in Appendix D. PCB compounds (Aroclor 1260) were detected in the oil samples from wells MW-7 and MW-16 at concentrations of 3.7 mg/kg and 19 mg/kg, respectively. The hydrocarbon products found in MW-7 and MW-16 were a close match to each other, and most closely resembled the laboratory's reference standard for lubricating oil.

During the gauging event on October 11, 2002, groundwater samples were collected from wells MW-7 and MW-16 for analysis of PCB, extractable petroleum hydrocarbons (EPH) and volatile petroleum hydrocarbon (VPH). Sampling was performed after gauging and purging of product. New sample tubes were inserted into the wells. A peristaltic pump was then used to draw the samples. The laboratory results are included in Appendix E.

PCBs were not detected in either of the samples above the laboratory Practical Quantitation Limit (PQL) of 1 ug/l. VPH were not detected in the sample from MW-7. However, VPH were detected in the sample from MW-16 at a total concentration of 1,961 ug/l, and VPH target compounds were detected at a total concentration of 66 ug/l. EPH were detected in the samples from MW-7 and MW-16 at total concentrations of 618 ug/l and 13,703 ug/l, respectively. EPH target compounds were detected in the sample from MW-16 at a total concentration of 11.6 ug/l. All surrogate recoveries were within acceptable range for the VPH and EPH analyses. During the previous sample event of MW-7 and MW-16 on November 9, 2001, VPH were detected at concentrations of 31 ug/l and 510 ug/l, and EPH were detected at 28 ug/l and 6 ug/l, respectively. Based on these results, it is possible that the recent samples from MW-16 contained a sheen from the separate-phase product.

Plans for Continuing Immediate Response Actions

Semi-monthly site checks will continue pending DEP approval of this IRA Plan. After such time, a hydrophobic bailer (PetroPore Model 250 or similar) will be installed in well MW-16. Information pertaining to the hydrophobic bailer is presented in Appendix F. Following installation of the hydrophobic bailer, the frequency of site checks will be adjusted according to the accumulation rate of oil in the bailer. The next IRA Status Report is scheduled to be submitted to the DEP on or before January 23, 2003.

In accordance with the NON, a copy of this IRA Plan is being submitted to the DEP Bureau of Waste Prevention concurrently with submittal to the Bureau of Waste Site Cleanup.

TABLES

TABLE 1
WELL GAUGING DATA

Murphy's Waste Oil Service, Inc.
252 Salem Street
Woburn, Massachusetts

Gauging Date: November 5, 2001

Location	Sample Group	Well Depth (feet)	Screen Interval (feet)	Reference Elevation (feet)	Gauging Reference	Depth to Oil (feet)	Depth to Water (feet)	Water Elevation (feet)
MW-1	A	15.0	5-15	53.28	PVC Rim	---	10.06	43.22
MW-2	A	15.0	5-15	53.88	PVC Rim	---	10.7	43.18
MW-3	C	14.0	4-14	52.86	PVC Rim	---	9.77	43.09
MW-3D	A	49.0	44-49	52.42	PVC Rim	---	9.22	43.2
MW-3BR	A	91.0	81-91	52.5	PVC Rim	---	9.27	43.23
MW-4	A	15.0	5-15	52.29	PVC Rim	---	9.12	43.17
MW-5S	A	15.0	5-15	53.89	PVC Rim	---	10.73	43.16
MW-5D	A	83.5	73.5-83.5	54.06	PVC Rim	---	10.95	43.11
MW-6	A	18.0	8-18	55.72	PVC Rim	---	12.61	43.11
MW-7	C	12.0	3-12	50.47	PVC Rim	7.24	7.48	43.2
MW-8	A/B	12.0	3-12	54.54	PVC Rim	---	11.38	43.16
MW-9	B	12.0	3-12	52.01	PVC Rim	---	8.85	43.16
MW-10	C	41.0	36-41	53.84	PVC Rim	---	10.64	43.2
MW-11	B	12.0	2-12	50.03	PVC Rim	---	7	43.03
MW-12	B	5.4	2.4-5.4	47.44	Casing Rim	---	4.35	43.09
SW-A	A	---	---	47.44	Casing Rim	---	Dry	---
MW-13	A	5.3	2.3-5.3	46.4	Casing Rim	---	3.23	43.17
SW-B	A	---	---	46.4	Casing Rim	---	Dry	---
MW-14	B	12.0	3-12	49.45	PVC Rim	---	6.35	43.1
MW-15	A	12.0	2-12	51.81	PVC Rim	---	8.69	43.12
MW-16	C	12.0	3-12	50.24	PVC Rim	7.05	7.49	43.13
MW-17	A/B	14.0	4-14	52.58	PVC Rim	---	9.49	43.09
MW-18S	B/C	10.0	5-10	47.44	PVC Rim	---	4.32	43.12
MW-18D	A	58.0	53-58	47.69	PVC Rim	---	4.49	43.2
MW-19	C	5.3	2.4-5.4	48.47	Casing Rim	---	5.41	43.06
MW-20	A	12.0	3-12	49.1	PVC Rim	---	5.99	43.11
MW-21	A	5.5	2.5-5.5	47.74	PVC Rim	---	4.55	43.19
MR-1SS	A	13.0	3-13	50.32	PVC Rim	---	7.18	43.14
MR-2SS	C	15.0	5-15	51.03	PVC Rim	7.79	7.8	43.24
MW-4S	A	13.0	3-13	46.56	PVC Rim	---	3.44	43.12
MW-4M	A	45.0	35-45	47.02	PVC Rim	---	3.82	43.2
MW-4D	A/B	95.0	90-95	47.6	PVC Rim	---	4.3	43.3
BW-2R	A	95.0	85-95	47.78	PVC Rim	---	4.54	43.24
BSW-2	A	20.0	10-20	48.04	Casing Rim	---	4.81	43.23
BW-3	A	44.0	34-44	47.38	PVC Rim	---	4.19	43.19
BW-4	A	42.0	32-42	45.55	PVC Rim	---	2.29	43.26
SW-C	A	---	---	45.55	PVC Rim	---	Dry	---

Note: 1. Surface water gauged at wells MW-12 (SW-A), MW-13 (SW-B), and BW-4 (SW-C).
2. Sample Groups: A-Previously non-detect; B-Low Concentrations; C-Moderate Concentrations.
3. Well MW-9 was gauged on November 9, 2001.
4. Water level corrected for oil thickness using specific gravity of oil of 0.87.

TABLE 2

WELL MONITORING FIELD DATA

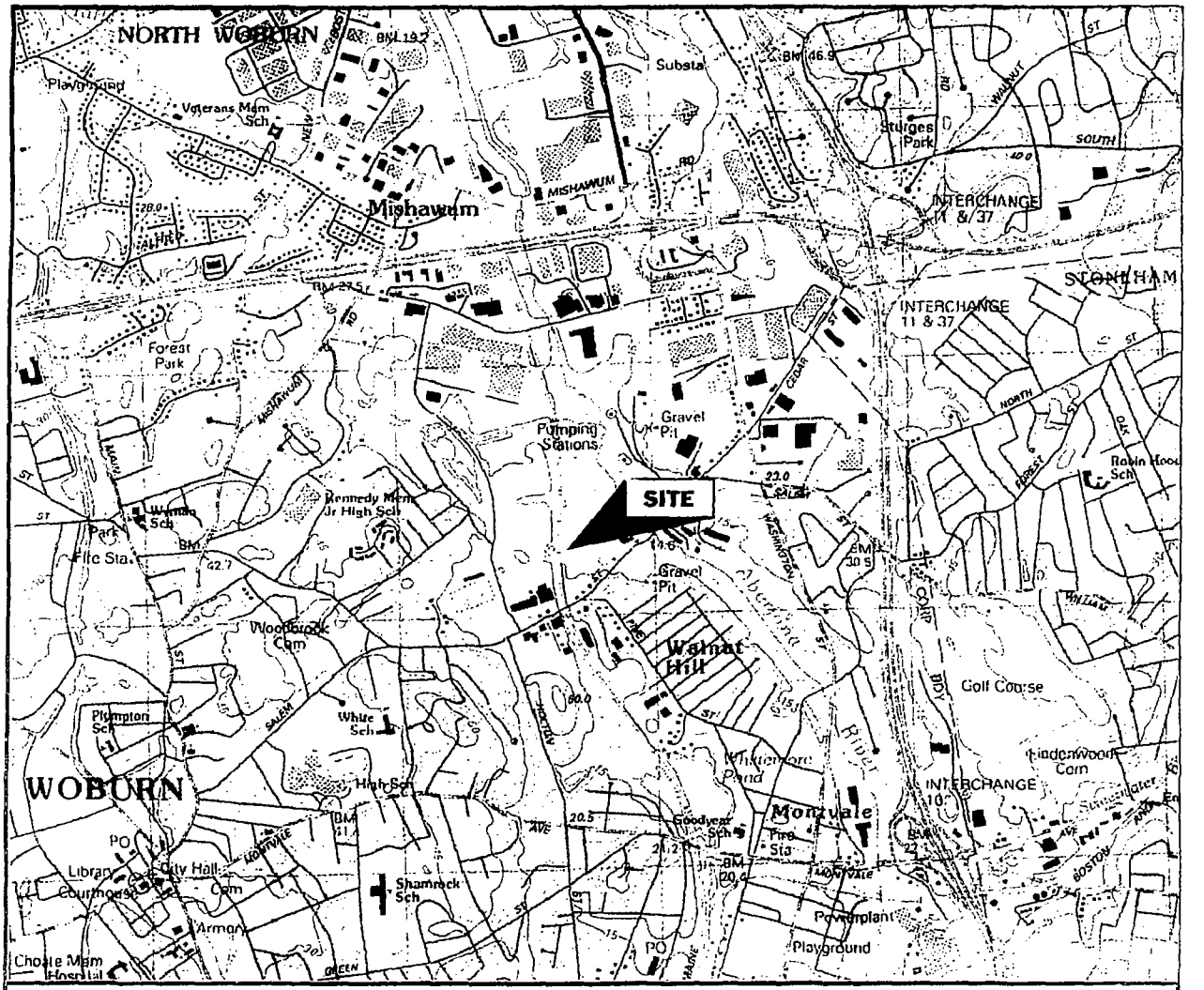
Murphy's Waste Oil Facility
252 Salem Street
Woburn, Massachusetts

	MW-7		MW-16	
Date	**Water Level**	**Oil Thickness**	**Water Level**	**Oil Thickness**
11/5/01	42.99	0.24	42.75	0.44
9/30/02	43.55	0.59	43.29	0.35
10/11/02	43.81	0.01	43.43	0.40
10/31/02	44.15	0.02	43.92	0.33
11/8/02	44.28	0.00	44.13	0.21

Notes:

1. Water level not corrected for oil thickness.

FIGURES 1-3



MA

QUADRANGLE LOCATION

SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

CONTOUR INTERVAL 3 METERS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

COORDINATES
UTM: 324682mE, 4706254mN
LONGITUDE: 71°07' 60" W
LATITUDE: 42°29' 27" N

ISSUE	DESCRIPTION	DRWN	CHKD	APPR	DATE
A	RAO STATEMENT				

BASE MAP: UNITED STATES GEOLOGICAL SURVEY (USGS), TOPO Wildflower Productions.

CleanHarbors
Environmental Services, Inc.
Remedial Technologies Division
392 LIBBEY INDUSTRIAL PARKWAY
WEYMOUTH, MASSACHUSETTS 02189
(781) 849-1800

Murphy's Waste Oil Service
252 Salem Street
Woburn, Massachusetts
LOCUS MAP

PROJECT NO.: EN183186
SCALE: AS SHOWN
DWG. NO.
FIGURE 1

NOTES:

1. PROPERTY LINE AND FEATURES TAKEN FROM "PLAN OF LAND IN WOBURN, MASSACHUSETTS" BY NORTHEAST SURVEY, INC. 730 BOSTON POST ROAD, SUDBURY, MASSACHUSETTS 01776, SHEET 1 OF 1, JOB NO. 30688, DATED APRIL 1, 1988. WETLAND DELINEATED ON MURPHY'S PROPERTY BY SANFORD ECOLOGICAL SERVICES.
2. POSTED DATA REPRESENT MAXIMUM CONCENTRATION OF TOTAL PETROLEUM HYDROCARBON (TPH) IN milligrams/kilogram WHICH WAS DETECTED IN BORING. THIS PLAN DOES NOT IMPLY DEPTH AT WHICH CONTAMINANTS WERE DETECTED.
3. BORING SERIES B-1A THROUGH B-12A PERFORMED JULY 1988. BORING SERIES CHI-1/87 THROUGH CHI-9/87 PERFORMED DECEMBER 1987. BORING SERIES CHI-1/88 THROUGH CHI-8/88 PERFORMED FEBRUARY 1988. BORING SERIES B-1 THROUGH B-27 AND MW-1 THROUGH MW-19 PERFORMED 1995-1997.
4. IMPACTED SOILS WITHIN FOOTPRINT OF FACILITY BUILDING WERE REMOVED DURING THE SHORT TERM MEASURE IN SPRING 1989.

LEGEND

- B-1 / 730 — SOIL BORING; CONCENTRATION OF TOTAL PETROLEUM HYDROCARBONS TPH (milligrams/kilogram mg/kg)
- 2,000 — TPH CONTOUR
- TPH CONTOUR (INFERRED)
- MR-2SS — EXISTING MONITORING WELL
- PROPERTY LINE
- S — SEWER LINE
- W — WATER LINE
- UTILITY POLE
- UTILITY BOX
- E.P. — EDGE OF PAVEMENT
- HYDRANT
- SMH — SEWER MANHOLE
- A — A' — CROSS-SECTION SEE CHES DWG. NO. 170-C-23

SEE CHES DRAWING NO. 170-C-12 FOR TPH WETLAND SOIL CONCENTRATIONS

TEMPORARY BENCHMARK PK NAIL IN POLE ELEV. = 51.38' NGVD

0 15 30 60 90 120
GRAPHIC SCALE

FIGURE 2

ISSUE	DESCRIPTION	DRWN	CHKD	APPR.	DATE
B	IRA PLAN	K.M.C.	C.J.M.	C.J.M.	11/21/02
A	PRELIMINARY	K.M.C.	C.J.M.	C.J.M.	3/11/98

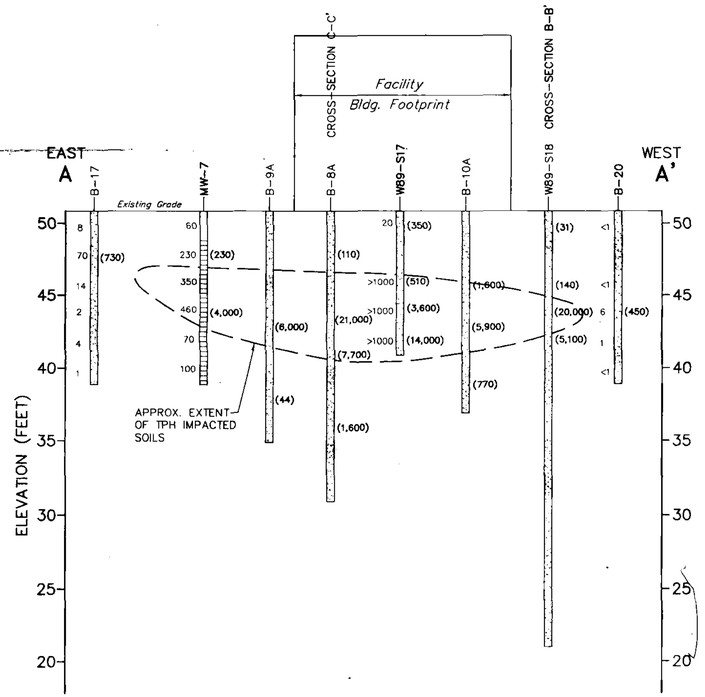
CleanHarbors
ENVIRONMENTAL SERVICES, INC.
ENVIRONMENTAL CONSTRUCTION & TECHNICAL SERVICES DIVISION
392 Libbey Industrial Parkway
Weymouth, Massachusetts 02189
Telephone (781) 849-1800

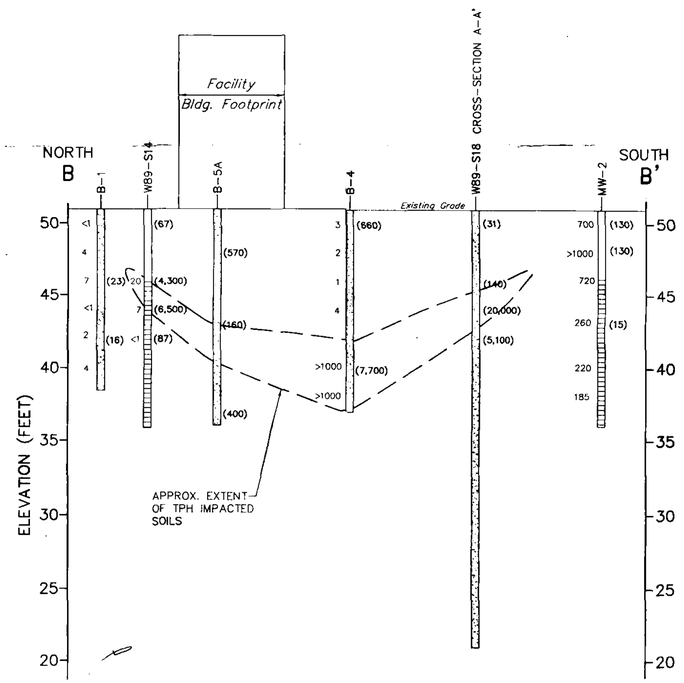
TITLE

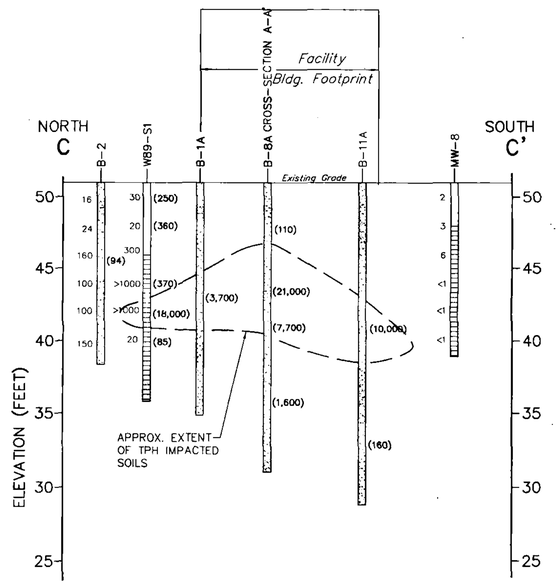
MURPHY'S WASTE OIL SERVICE, INC.
252 SALEM STREET
WOBURN, MASSACHUSETTS 01801

DISTRIBUTION OF TPH IN SOIL

PROJECT NO. EN183186
SCALE 1"=30'
DRAWING NO. 170-C-17



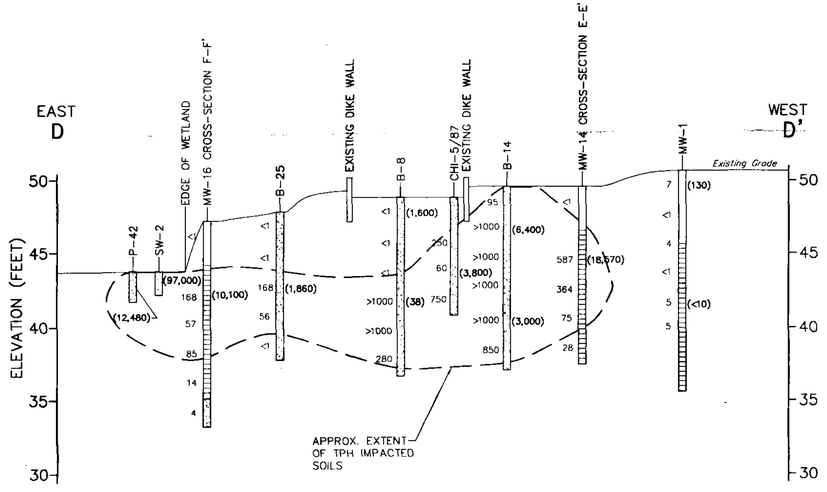


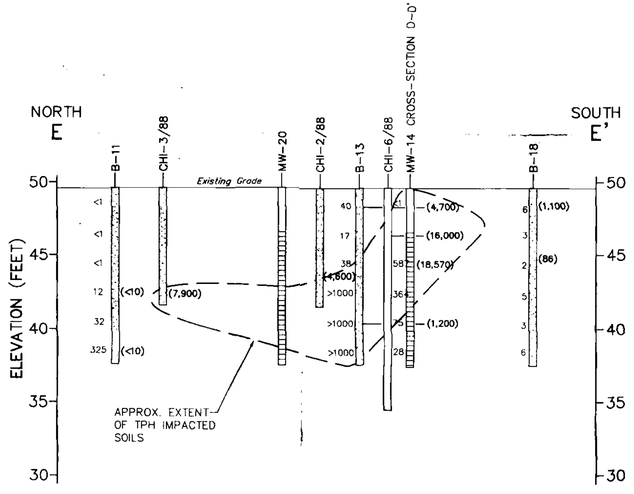


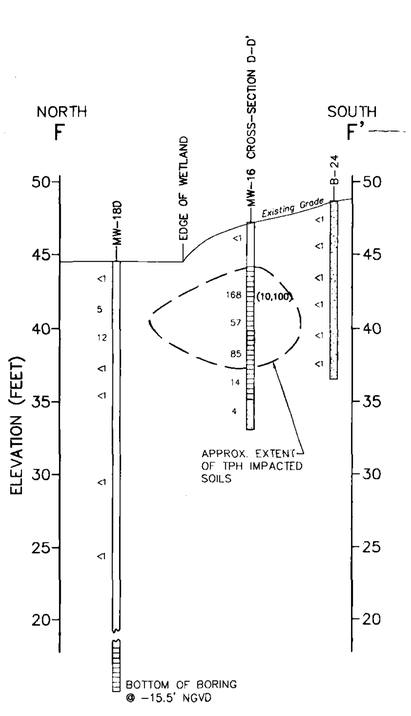
LEGEND

168 RESULTS OF HEADSPACE FIELD SCREENING OF SOIL SAMPLES IN PARTS PER MILLION (ppm)

(10,100) TOTAL PETROLEUM HYDROCARBONS (TPH) CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM (mg/kg)







NOTES

1. BORING SERIES B-1A THROUGH B-12A PERFORMED JULY 1988. BORING SERIES CHI-1/87 THROUGH CHI-9/87 PERFORMED DECEMBER 1987. BORING SERIES CHI-1/88 THROUGH CHI-8/88 PERFORMED FEBRUARY 1988. BORING SERIES B-1 THROUGH B-27 AND MW-1 THROUGH MW-19 PERFORMED 1995-1997.
2. IMPACTED SOILS WITHIN FOOTPRINT OF FACILITY BUILDING WERE REMOVED DURING THE SHORT TERM MEASURE IN SPRING 1989.
3. FOR CROSS-SECTION LOCATIONS SEE CHES DRAWING NO. 170-C-17.

SCALE: 1"=30' HORIZONTAL
1"=5' VERTICAL
VERTICAL EXAGGERATION = 6X

FIGURE 3

ISSUE	DESCRIPTION	DRWN.	CHKD	APPR	DATE
B	IRA PLAN	K.M.C.	C.J.M.	C.J.M.	3/11/98
A	PRELIMINARY	K.M.C.	C.J.M.	C.J.M.	3/11/98

CleanHarbors
ENVIRONMENTAL SERVICES, INC.
ENVIRONMENTAL CONSTRUCTION & TECHNICAL SERVICES DIVISION
392 Libbey Industrial Parkway
Weymouth, Massachusetts 02189
Telephone (781) 849-1800

TITLE: **MURPHY'S WASTE OIL SERVICE, INC.**
252 SALEM STREET
WOBURN, MASSACHUSETTS 01801

CROSS-SECTIONS

PROJECT NO	DRAWING NO.
EN183186	170-C-23
SCALE: AS NOTED	

APP. A

Massachusetts Department of Environmental Protection **BWSC-105**

Bureau of Waste Site Cleanup

IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart

Release Tracking 3 - 22144

A. RELEASE OR THREAT OF RELEASE LOCATION:

LNAPL
PCB @ 19 ppm

Release Name: _____

Street: 252 Salem Street Location Aid: _____

City/Town: Woburn ZIP Code: 01801-0000

☐ Check here if a Tier Classification Submittal has been provided to DEP for this Release Tracking Number.

☐ Check here if this location is Adequately Regulated, pursuant to 310 CMR 40.0110-0114.

Specify Program: ☐ CERCLA ☐ HSWA Corrective Action ☐ Solid Waste Management ☑ RCRA State Program (21C Facilities)

Related Release Tracking Numbers That This IRA Addresses: _____

B. THIS FORM IS BEING USED TO: (check all that apply)

☑ Submit an **IRA Plan** (complete Sections A, B, C, D, E, H, I, J and K).

☐ Check here if this IRA Plan is an update or modification of a previously approved written IRA Plan. Date _____

☐ Submit an **Imminent Hazard Evaluation** (complete Sections A, B, C, F, H, I, J and K).

☐ Submit an **IRA Status Report** (complete Sections A, B, C, E, H, I, J and K).

☐ Submit a **Request to Terminate an Active Remedial System and/or Terminate a Continuing Response Action(s) Taken to Address an Imminent Hazard** (complete Sections A, B, C, D, E, H, I, J and K).

☐ Submit an **IRA Completion Statement** (complete Sections A, B, C, D, E, G, H, I, J and K).

You must attach all supporting documentation required for each use of form indicated, including copies of any Legal Notices and Notices to Public Officials required by 310 CMR 40.1400.

C. RELEASE OR THREAT OF RELEASE CONDITIONS THAT WARRANT

Identify Media and Receptors Affected: (check all that ☐ Air ☑ Groundwater ☐ Surface Water ☐ Sediments ☑ Soil

☐ Wetland ☐ Storm Drain ☐ Paved Surface ☐ Private Well ☐ Public Water Supply ☐ Zone 2 ☐ Residence

☐ School ☐ Unknown ☐ Other Specify _____

Identify Conditions That Require IRA, Pursuant to 310 CMR 40.0412: (check all that apply) ☐ 2 Hour Reporting Condition(s)

☑ 72 Hour Reporting Condition(s) ☐ Substantial Release Migration ☐ Other Condition(s)

Describe greater than 1/2-inch of LNAPL on groundwater in monitoring well.

Identify Oils and Hazardous Materials Released: (check all that apply) ☑ Oils ☐ Chlorinated Solvents ☐ Heavy Metals

☑ Others Specify: Polychlorinated biphenyl compounds in oil at 19 mg/kg.

D. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply)

☐ Assessment and/or Monitoring Only

☐ Excavation of Contaminated Soils

☐ Re-use, Recycling or Treatment

○ On Site ○ Off Site Est. Vol.: _____ cubic yards

Describe: _____

☐ Store ○ On Site ○ Off Site Est. Vol.: _____ cubic yards

☐ Landfill ○ Cover ○ Disposal Est. Vol.: _____ cubic yards

☐ Removal of Drums, Tanks or Containers

Describe: _____

☐ Deployment of Absorbent or Containment Materials

☐ Temporary Covers or Caps

☐ Bioremediation

☐ Soil Vapor Extraction

☐ Structure Venting System

☑ Product or NAPL Recovery

☐ Groundwater Treatment Systems

☐ Air Sparging

☐ Temporary Water Supplies

SECTION D IS CONTINUED ON THE NEXT PAGE.

D. DESCRIPTION OF RESPONSE ACTIONS (continued):

☐ Removal of Other Contaminated Media

Specify Type and _____

☐ Temporary Evacuation or Relocation of Residents

☐ Fencing and Sign Posting

☐ Other Response Actions Describe _____

☐ Check here if this IRA involves the use of Innovative Technologies (DEP is interested in using this information to aid in creating an Innovative Technologies Clearinghouse).

Describe _____

E. TRANSPORT OF REMEDIATION WASTE: (if Remediation Waste has been sent to an off-site facility, answer the following

Name of None to date

Town and State: _____

Quantity of Remediation Waste Transported to _____

F. IMMINENT HAZARD EVALUATION SUMMARY: (check one of the following)

☐ Based upon an evaluation, an Imminent Hazard exists in connection with this Release or Threat of Release.

☐ Based upon an evaluation, an Imminent Hazard does not exist in connection with this Release or Threat of Release

☐ Based upon an evaluation, it is unknown whether an Imminent Hazard exists in connection with this Release or Threat of Release, and further assessment activities will be undertaken.

☐ Based upon an evaluation, it is unknown whether an Imminent Hazard exists in connection with this Release or Threat of Release. However, response actions will address those conditions that could pose an Imminent Hazard.

G. IRA COMPLETION STATEMENT:

☐ Check here if future response actions addressing this Release or Threat of Release will be conducted as part of the Response Actions planned for a Site that has already been Tier Classified under a different Release Tracking Number, or a Site that is identified on the Transition List as described in 310 CMR 40.0600 (i. e., a Transition Site, which includes Sites with approved Waivers). These additional response actions must occur according to the deadlines applicable to the earlier Release Tracking Number (i. e., Site ID Number).

State Release Tracking Number (i. e., Site ID Number) of Tier Classified Site or Transition _____

If any Remediation Waste will be stored, treated, managed, recycled or reused at the site following submission of the IRA Completion Statement, you must submit either a Release Abatement Measure (RAM) Plan or a Phase IV Remedy Implementation Plan, along with the appropriate transmittal form, as an attachment to the IRA Completion Statement.

H. LSP OPINION:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and (iii) the provisions of 309 CMR 4.03(5), to the best of my knowledge, information and belief,

> *if Section B of this form indicates that an **Immediate Response Action Plan** is being submitted*, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B of this form indicates that an **Imminent Hazard Evaluation** is being submitted*, this Imminent Hazard Evaluation was developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and the assessment activity(ies) undertaken to support this Imminent Hazard Evaluation complies(y) with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000;

> *if Section B of this form indicates that an **Immediate Response Status Report** is being submitted*, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B of this form indicates that an **Immediate Response Action Completion Statement** or a **Request to Terminate an Active Remedial System and/or Terminate a Continuing Response Action(s) Taken to Address an Imminent Hazard** is being submitted*, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal.

SECTION H IS CONTINUED ON THE NEXT PAGE.

Massachusetts Department of Environmental Protection **BWSC-105**
Bureau of Waste Site Cleanup

IMMEDIATE RESPONSE ACTION (IRA) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0424 - 40.0427 (Subpart D)

Release Tracking 3 - 22144

H. LSP Opinion (continued):

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

☑ Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

LSP Name: Charles J. McCreery LSP #: 9090 Stamp:

Telephone: 781-849-1800 Ext.: 8399

FAX: (optional) 781-794-1760

Signature:

Date: 11/25/02

COMMONWEALTH OF MASSACHUSETTS
CHARLES J. McCREERY
No. 9090
REGISTERED
LICENSED SITE PROFESSIONAL

I. PERSON UNDERTAKING IRA:

Name of Murphy's Waste Oil Service, Inc.

Name of Contact: William F. Connors Title: Vice President

Street: P.O. Box 859048

City/Town: Braintree State: MA ZIP Code: 02185-9048

Telephone: 781-849-1800 Ext.: 1357 FAX:

☐ Check here if there has been a change in the person undertaking the IRA.

J. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON UNDERTAKING IRA: (check one)

☑ RP or PRP Specify ○ Owner ◉ Operator ○ Generator ○ Transporter Other RP or PRP:

☐ Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ Any Other Person Undertaking IRA Specify

K. CERTIFICATION OF PERSON UNDERTAKING IRA:

I, William F. Connors, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

By: Wm F Connors Title: Vice President
(signature)

For: Murphy's Waste Oil Service, Inc. Date: 11/25/02
(print name of person or entity recorded in Section I)

Enter address of the person providing certification, if different from address recorded in Section I:

Street:

City/Town: State: ZIP Code:

Telephone: Ext. FAX:

YOU MUST COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

APP. B

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

JANE M. SWIFT
Governor

BOB DURAND
Secretary

LAUREN A. LISS
Commissioner

CERTIFIED MAIL # 7002 0460 0001 0466 0266

August 26, 2002

Clean Harbors Environmental Services, Inc.
1501 Washington Street
P.O. Box 859048
Braintree, MA 02185-9048

RE: Murphy's Waste
Oil Service, Inc.

ATTN: Jules B. Selden

Noncompliance - Murphy's license
condition in Section B (10)(1)
Status: TSDF
MAD0665880005

NON-BO-02-9094-23

NOTICE OF NONCOMPLIANCE

THIS IS AN IMPORTANT NOTICE. FAILURE TO TAKE ADEQUATE ACTION IN RESPONSE TO THIS NOTICE COULD RESULT IN SERIOUS LEGAL CONSEQUENCES.

Department personnel have reviewed the "Groundwater Monitoring Plan" (GWMP) dated April 8, 2002 submitted to the Department. Clean Harbors Environmental Services, Inc. (CHI) prepared the GWMP on behalf of Murphy's Waste Oil Service, Inc. (Murphy's) located at 252 Salem Street, Woburn, Massachusetts. The Department noted in the GWMP that on November 5, 2001 releases were found that required notification to the Department. Murphy's failure to notify the Department is in noncompliance with one or more laws, regulations, orders, licenses, permits or approvals enforced by the Department.

Attached hereto is a written description of: 1. Each activity referred to above, 2. The requirements violated, 3. The action the Department now wants you to take, and 4.The deadline for taking such action. An administrative penalty may be assessed for every day from now on that you are in noncompliance with the requirements described in this Notice of Noncompliance.

Notwithstanding this Notice of Noncompliance, the Department reserves the right to exercise the full extent of its legal authority in order to obtain full compliance with all applicable requirements, including, but not limited to, criminal prosecution, civil action including court-imposed civil penalties, or administrative penalties assessed by the Department.

Sincerely,

Steven A. DeGabriele
Director
Business Compliance Division
Bureau of Waste Prevention

(Attachment)

cc: Woburn Board of Health
Enforcement File
William Sirull - Licensing File
Office of Enforcement
Kingsley Ndi - BWSC/NERO
Ed Pawlowski - BWP/NERO
Anna Mayor - Boston
Mary E. Garren- EPA Superfund Section
Robert W. Brackett- EPA RCRA Section
Al Nardone - Boston
Anna Stern - Boston

NOTICE OF NONCOMPLIANCE
NONCOMPLIANCE SUMMARY

NAME OF ENTITY IN NONCOMPLIANCE:

Murphy's Waste Oil Service, Inc.

LOCATION WHERE NONCOMPLIANCE OCCURRED OR WAS OBSERVED:

252 Salem Street, Woburn, MA

DATE WHEN NONCOMPLIANCE OCCURRED OR WAS OBSERVED:

November 8, 2001

DESCRIPTION OF NONCOMPLIANCE, REQUIREMENTS NOT COMPLIED WITH, ACTION TO BE TAKEN AND THE DEADLINE FOR TAKING SUCH ACTION:

On June 25, 2002, Department personnel reviewed the Ground Water Monitoring Plan (GWMP), dated April 8, 2002, for Murphy's Waste Oil Service, Inc. (Murphy's) located at 252 Salem Street, Woburn, Massachusetts. Clean Harbors Environmental Services, Inc. prepared the GWMP on behalf of Murphy's. According to the GWMP, Murphy's failed to:

1. Report a 72 hour release to the Department's Northeast Regional Office (NERO), pursuant to 310 CMR 40.0313(1) for the release of Light Non-Aqueous Phase Liquid (LNAPL) found in three monitoring wells. The wells had a measured thickness greater than ½ inch as discovered during the gauging of wells on November 5, 2001.

The failure to notify the release is a violation of license condition Section B (10)(a)(1) that references 310 CMR 40.0113 RCRA Authorized State Hazardous Waste Program (M.G.L. c. 21C and 310 CMR 30.000) in Murphy's Facility License (#23B/93).

The Department requires that Murphy's shall:

1. Notify the Department's Northeast Regional Office, Bureau of Waste Site Cleanup (NERO/BWSC) of the 72-hour release pursuant to 40.0313 previously stated herein.
2. Develop an immediate response action plan pursuant to 40.0410
3. Provide a written response to the Department's Bureau of Waste Prevention located at 1 Winter Street, Boston 02108 (ATTN: Ralph Fine) within fifteen (15) days of your receipt of this Notice, addressing the items above. The plan shall discuss the actions to be taken in order to achieve and maintain compliance with the (MCP) 310 CMR 40.0000 Regulations and Section B (10)(a)(1) of the Facility License.

4. The Department (BWP) in Boston (ATTN: Ralph Fine) shall be copied on any Interim Status Reports or a Response Action Completion Report submitted to NERO that will address the actions taken.

Should you have any questions relative to this Notice or to hazardous waste management at your company, please contact Jeff Chormann of this office at (617)- 292-5888.

DATE: 8/26/02

BY: Steven A. DeGabriele
Steven A. DeGabriele
Director
Business Compliance Division
Bureau of Waste Prevention

APP. C

CleanHarbors
ENVIRONMENTAL SERVICES, INC.
392 LIBBEY INDUSTRIAL PARKWAY * WEYMOUTH, MA 02189
(781) 849-1800 FAX (781) 794-1760
Visit our Website at www.cleanharbors.com

VIA CERTIFIED MAIL 7000 1670 0007 7655 1958

November 21, 2002

Massachusetts Department of Environmental Protection
Northeast Region
205A Lowell Street
Wilmington, MA 01887

Re: Release Notification Form
Murphy's Waste Oil Service, Inc.
252 Salem Street
Woburn, Massachusetts
RTN #3-22144

To Whom it May Concern:

Enclosed please find the Release Notification Form for Release Tracking Number (RTN) 3-22144. An Immediate Response Action Plan will be forwarded to your office to detail proposed response actions to address the site conditions.

If you have any questions concerning this letter, please do not hesitate to contact me at (781) 849-1800, extension 8399.

Sincerely,

Charles J. McCreery, CPG, LSP
Senior Project Manager

C:\My Documents\CJM-Active\Murphy's Active\Correspondence\DEP 10.15.01.doc

Massachusetts Department of Environmental Protection **BWSC-103**

Bureau of Waste Site Cleanup

Release Tracking 3 - 22144 (If assigned by DEP)

RELEASE NOTIFICATION & NOTIFICATION RETRACTION FORM

Pursuant to 310 CMR 40.0335 and 310 CMR 40.0371 (Subpart

A. RELEASE OR THREAT OF RELEASE LOCATION:

Street: 252 Salem Street Location Aid: Murphy's Waste Oil

City/Town: Woburn ZIP Code: 01801-0000

B. THIS FORM IS BEING USED (check one)

☑ Submit a **Release Notification** (complete all sections of this form).

☐ Submit a **Retraction of a Previously Reported Notification** of a Release or Threat of Release (complete Sections A, B, E, F and G of this form). You **MUST** attach the supporting documentation required by 310 CMR 40.0335.

C. INFORMATION DESCRIBING THE RELEASE OR THREAT OF RELEASE (TOR):

Date and time you obtained knowledge of the Release or TOR. 11/05/01 Time: 3:00 Specify: ☐ AM ☑ PM

The date you obtained knowledge is always required. The time you obtained knowledge is not required if reporting only 120 Day Conditions.

IF KNOWN, record date and time release or TOR occurred. _____ Time: _____ Specify: ☐ AM ☐ PM

☑ Check here if you previously provided an Oral Notification to DEP (2 Hour and 72 Hour Reporting Conditions only).

Provide date and time of Oral Notification. 09/25/02 Time: 9:38 Specify: ☑ AM ☐ PM

Check all Notification Thresholds that apply to the Release or Threat of Release: (for more information see 310 CMR 40.0310 - 40.0315)

2 HOUR REPORTING CONDITIONS

- ☐ Sudden Release
- ☐ Threat of Sudden Release
- ☐ Oil Sheen on Surface Water
- ☐ Poses Imminent Hazard
- ☐ Could Pose Imminent Hazard
- ☐ Release Detected in Private Well
- ☐ Release to Storm Drain
- ☐ Sanitary Sewer Release (Imminent Hazard Only)

72 HOUR REPORTING CONDITIONS

- ☑ Subsurface Non-Aqueous Phase Liquid (NAPL) Equal to or Greater than 1/2 Inch
- ☐ Underground Storage Tank (UST) Release
- ☐ Threat of UST Release
- ☐ Release to Groundwater near Water Supply
- ☐ Release to Groundwater near School or Residence

120 DAY REPORTING CONDITIONS

- ☐ Release of Hazardous Material(s) to Soil or Groundwater Exceeding Reportable Concentration(s)
- ☐ Release of Oil to Soil Exceeding Reportable Concentration(s) and Affecting More than 2 Cubic Yards
- ☐ Release of Oil to Groundwater Exceeding Reportable Concentration(s)
- ☐ Subsurface Non-Aqueous Phase Liquid (NAPL) Equal to or Greater than 1/8 Inch and Less than 1/2 Inch

List below the Oils or Hazardous Materials that exceed their Reportable Concentration or Reportable Quantity by the greatest amount. If necessary, attach a list of additional Oil and Hazardous Material substances subject to reporting.

Name and Quantities of Oils (O) and Hazardous Materials (HM)

O or HM Released	O (check one)	HM (check one)	CAS # (if known)	Amount or Concentration	Units	Reportable Concentrations Exceeded, if Applicable (RCS-1, RCS-2, RCGW-1, RCGW-2)
Lubricating Oil	☑	☐		0.44	foot	
Polychlorinated Biphenyls	☐	☑	01336-36-3	19	mg/kg	in LNAPL
	☐	☐				

D. ADDITIONAL INVOLVED PARTIES:

☐ Check here if attaching names and addresses of owners of properties affected by the Release or Threat of Release, other than an owner who is submitting this Release Notification (required).

☐ Check here if attaching Licensed Site Professional (LSP) name and address (optional).

You may write in names and addresses on the bottom of the second page of this form.

Massachusetts Department of Environmental Protection **BWSC-103**
Bureau of Waste Site Cleanup

Release Tracking
3 - 22144
If assigned by DEP

RELEASE NOTIFICATION & NOTIFICATION RETRACTION FORM
Pursuant to 310 CMR 40.0335 and 310 CMR 40.0371 (Subpart C)

E. PERSON REQUIRED TO NOTIFY:

Name of: Murphy's Waste Oil Service, Inc.

Name of Contact: Jules B. Selden Title: Attorney

Street: P.O. Box 859048

City/Town: Braintree State: MA ZIP Code: 02185-9048

Telephone: 781-849-1800 Ext.: 4182 FAX: 781-356-1375

F. RELATIONSHIP OF PERSON REQUIRED TO NOTIFY TO RELEASE OR THREAT OF RELEASE: (check one)

☑ RP or PRP Specify ○ Owner ☑ Operator ○ Generator ○ Transporter Other RP or PRP: _____

☐ Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ Any Person Otherwise Required to Notify Specify _____

G. CERTIFICATION OF PERSON REQUIRED TO NOTIFY:

I, Jules B. Selden, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

By: Jules B. Selden Title: Attorney
(signature)

For: Murphy's Waste Oil Service, Inc. Date: 10/04/02
(print name of person or entity recorded in Section E)

Enter address of the person providing certification, if different from address recorded in Section E:

Street: _____

City/Town: _____ State: _____ ZIP Code: _____

Telephone: _____ Ext. _____ FAX: (optional) _____

YOU MUST COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

APP D

CleanHarbors®
ENVIRONMENTAL SERVICES, INC.
1 HILL AVE., P.O. BOX 859048 • BRAINTREE, MA 02185-9048
(781) 849-1800 • FAX (781) 848-1955
Visit our Website at www.cleanharbors.com

Report of Analysis

Clean Harbors Environmental Services, Inc.
392 Libbey Industrial PWY
Weymouth, MA 02189

Project: Murphy's Oil
P.O. #: EN183186

Date Received 10/01/2002
CHES Lab #: G0204064

Attn: Mr. Jay McCreery

Enclosed are the results for the sample(s) delivered to our laboratory (DEP Laboratory ID# M-MA032) on the date indicated above.

The methods listed represent those methodologies which were used to develop the best analytical techniques. Analytical results and quality assurance protocols are based on these guidelines. These meet the requirements for the reporting of results under the RCRA, NPDES and Safe Drinking Water Act regulations.

Clean Harbors Environmental Services has an active program of quality assurance and quality control. The program closely follows the guidance provided in the EPA Contract Laboratory Program Statement of Work (organic and inorganic), the guidance provided in SW-846, and many other pertinent documents.

Should you have any questions concerning this work, please do not hesitate to contact me.

The information contained in this report is, to the best of my knowledge, accurate and complete.

Per Date: Michael J. Murray 10/3/02
Michael J. Murray
Laboratory Director

CASE NARRATIVE

Clean Harbors Environmental Services Companies

Prepared for:

Clean Harbors Environmental Services, Inc.
392 Libbey Industrial PWY
Weymouth, MA 02189

ETR: **G0204064**

Project: **Murphy's Oil**

The following samples were received as indicated below and on the attached Chain of Custody record. All analyses were performed within the holding time and with acceptable quality control results unless otherwise noted.

SAMPLE ID	LAB ID	MATRIX	Date Collected	Date Received
MW-7	0204064-01	OIL	09/30/2002	10/01/2002
MW-16	0204064-02	OIL	09/30/2002	10/01/2002

For TPH by GC/FID analysis:

Addition of surrogates for TPHFID not applicable (NA) to the method.

For both samples: Petroleum hydrocarbon product detected most closely matches this laboratory's lubricating oil reference standard. The hydrocarbon products found in MW-7 and MW-16 were a close match to each other.

The enclosed results of analyses are representative of the samples as received by the laboratory. We make no representations or certifications as to the methods of sample collection, sample identification, or transportation handling procedures used prior to our receipt of samples. To the best of my knowledge, the information contained in this report is accurate and complete.

Approved By: Michael Mulvey Date: 10/3/02

Clean Harbors Environmental Services Companies

ANALYTICAL REPORT

Clean Harbors Environmental Services Companies

Clean Harbors Environmental Services,
392 Libbey Industrial PWY
Weymouth, MA 02189

Project: Murphy's Oil

ETR: G0204064
LAB ID: 0204064-01
Method Blank: 0005873-01

8082 PCB as Aroclors Oil

SAMPLE ID: MW-7

Date Received	Date Collected	Date Analyzed	Matrix	Units	Analyst
10/1/02	9/30/02	10/1/02	OIL	mg/kg	MW

Parameter	Result	PQL
Aroclor 1016	ND	2.0
Aroclor 1221	ND	2.0
Aroclor 1232	ND	2.0
Aroclor 1242	ND	2.0
Aroclor 1248	ND	2.0
Aroclor 1254	ND	2.0
Aroclor 1260	3.7	2.0

Compound	% Recovered	QC Limits (%)	
TCMX (surr)	84	52	161

DL = diluted out

ANALYTICAL REPORT

Clean Harbors Environmental Services Companies

Clean Harbors Environmental Services,
392 Libbey Industrial PWY
Weymouth, MA 02189

Project: Murphy's Oil

ETR: G0204064
LAB ID: 0204064-01
Method Blank:

Total Petroleum Hydrocarbons by GC/FID

SAMPLE ID: MW-7

Date Received	Date Collected	Date Analyzed	Matrix	Units	Analyst
10/1/02	9/30/02	10/2/02	OIL	mg/kg	MW

Parameter	Result	PQL
Total Petroleum Hydrocarbons	**500,000**	96,000

Compound	% Recovered	QC Limits (%)	
OTP (surr)	NA	40	140

DL = diluted out

ANALYTICAL REPORT

Clean Harbors Environmental Services Companies

Clean Harbors Environmental Services,
392 Libbey Industrial PWY
Weymouth, MA 02189

Project: Murphy's Oil

ETR: G0204064
LAB ID: 0204064-02
Method Blank: 0005873-01

8082 PCB as Aroclors Oil

SAMPLE ID: MW-16

Date Received	Date Collected	Date Analyzed	Matrix	Units	Analyst
10/1/02	9/30/02	10/1/02	OIL	mg/kg	MW

Parameter	Result	PQL
Aroclor 1016	ND	2.0
Aroclor 1221	ND	2.0
Aroclor 1232	ND	2.0
Aroclor 1242	ND	2.0
Aroclor 1248	ND	2.0
Aroclor 1254	ND	2.0
Aroclor 1260	19	2.0

Compound	% Recovered	QC Limits (%)	
TCMX (surr)	87	52	161

DL = diluted out

ANALYTICAL REPORT

Clean Harbors Environmental Services Companies

Clean Harbors Environmental Services,
392 Libbey Industrial PWY
Weymouth, MA 02189

Project: Murphy's Oil

ETR: G0204064
LAB ID: 0204064-02
Method Blank:

Total Petroleum Hydrocarbons by GC/FID

SAMPLE ID: MW-16

Date Received	Date Collected	Date Analyzed	Matrix	Units	Analyst
10/1/02	9/30/02	10/2/02	OIL	mg/kg	MW

Parameter	Result	PQL
Total Petroleum Hydrocarbons	**610,000**	79,000

Compound	% Recovered	QC Limits (%)	
OTP (surr)	NA	40	140

DL = diluted out

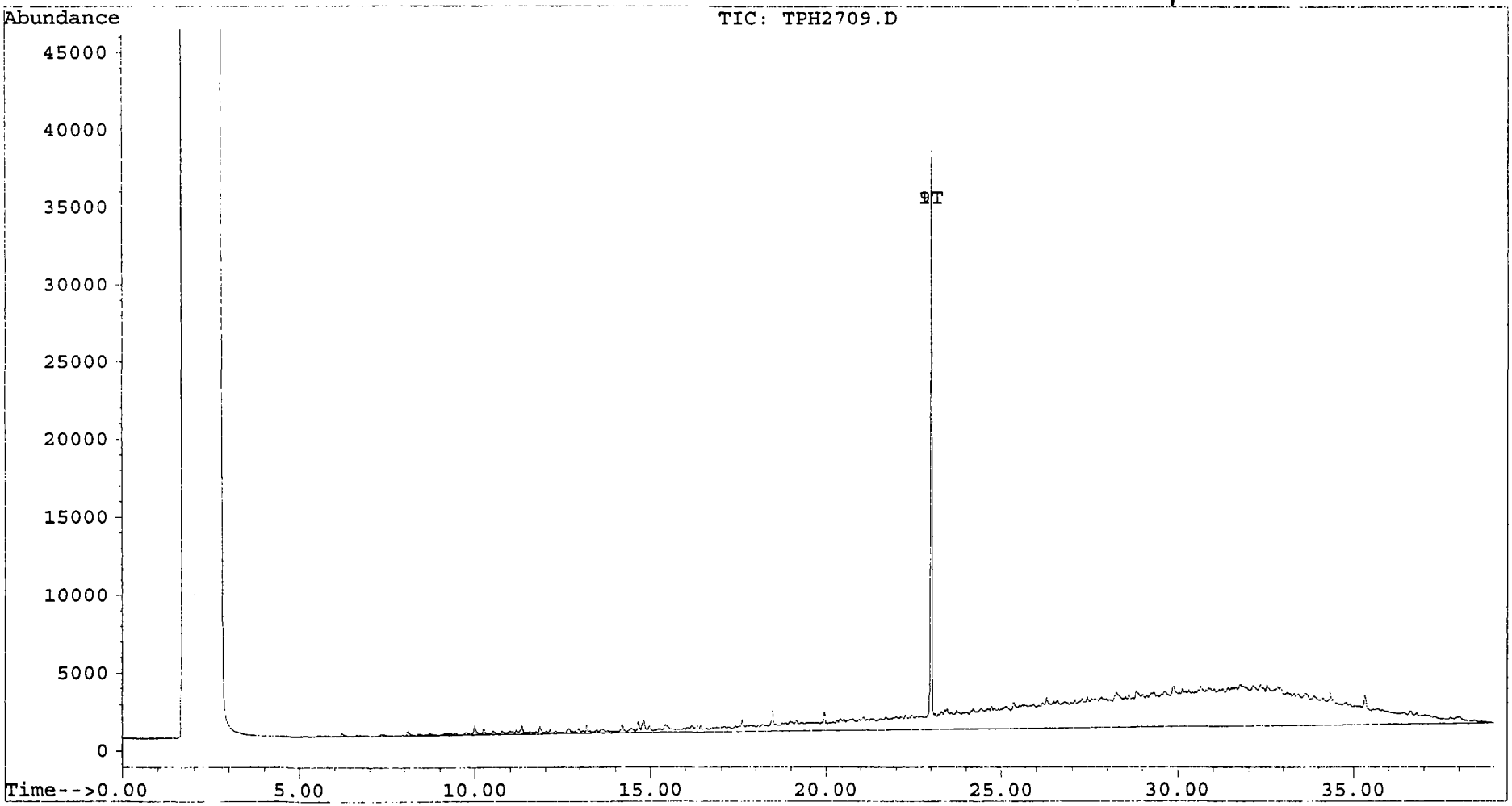
Data File : H:\HPCHEM\5\DATA\TPH1002\TPH2709.D
Acq On : 02 Oct 02 09:52 AM
Sample : G0204064-01 TPHO 10;1-5
Misc : 1 uL shot IS MQ173W
Quant Time: Oct 2 10:42 19102

Vial: 4
Operator: Eric/Miles/Phil R.
Inst : 5890-1R
Multiplr: 1.00

Method : H:\HPCHEM\5\METHODS\TPHFID.M
Title : TPH By GC/FID
Last Update : Tue Mar 19 11:06:36 2002
Response via : Multiple Level Calibration

Volume Inj. :
Signal Phase :
Signal Info :

0.1 Sample MW-7



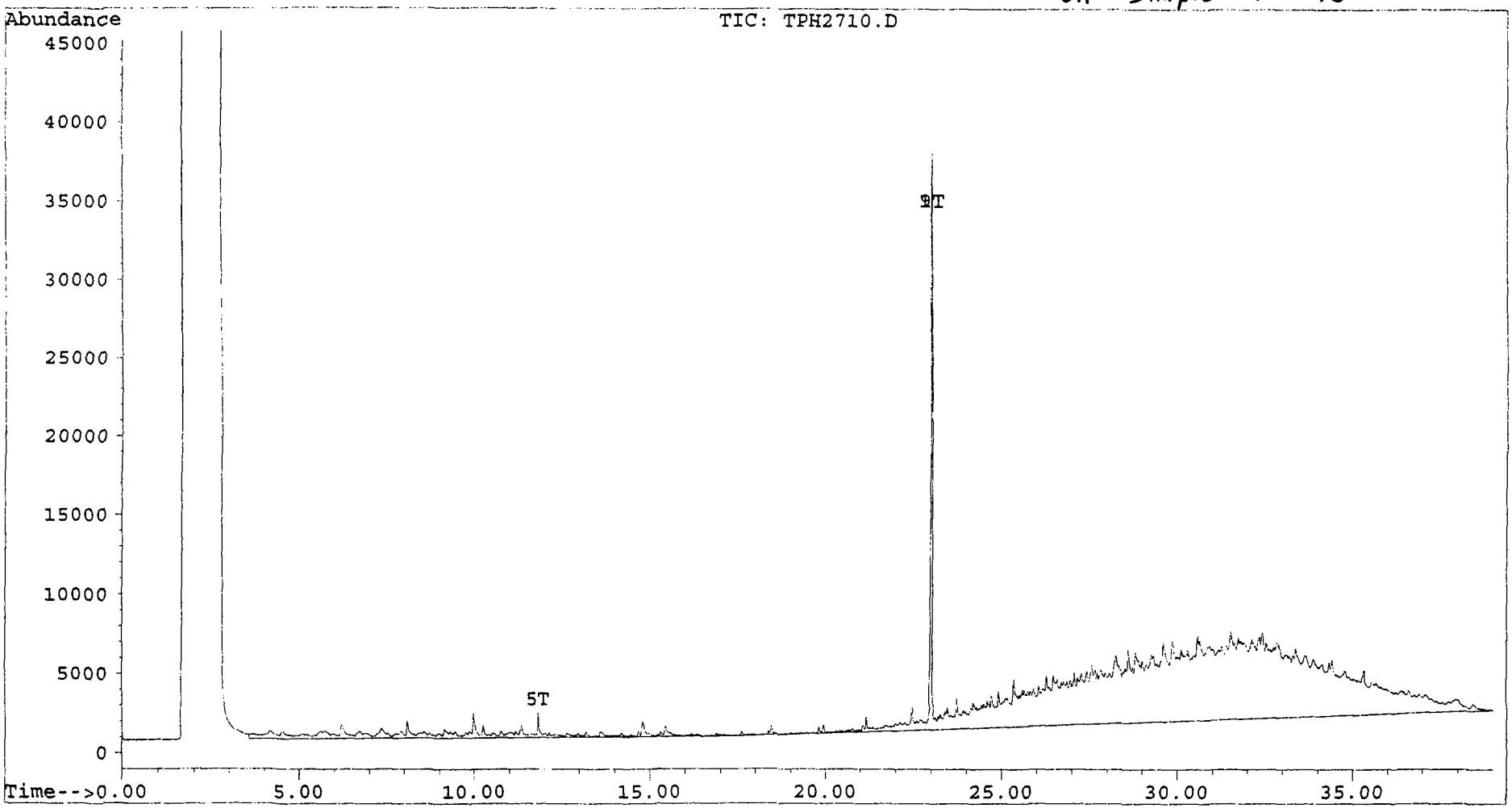
Data File : H:\HPCHEM\5\DATA\TPH1002\TPH2710.D
Acq On : 02 Oct 02 10:40 AM
Sample : G0204064-02 TPHO 10;1-5
Misc : 1 uL shot IS MQ173W
Quant Time: Oct 2 18:15 19102

Vial: 5
Operator: Eric/Miles/Phil R.
Inst : 5890-1R
Multiplr: 1.00

Method : H:\HPCHEM\5\METHODS\TPHFID.M
Title : TPH By GC/FID
Last Update : Tue Mar 19 11:06:36 2002
Response via : Multiple Level Calibration

Volume Inj. :
Signal Phase :
Signal Info :

Oil Sample MW-16



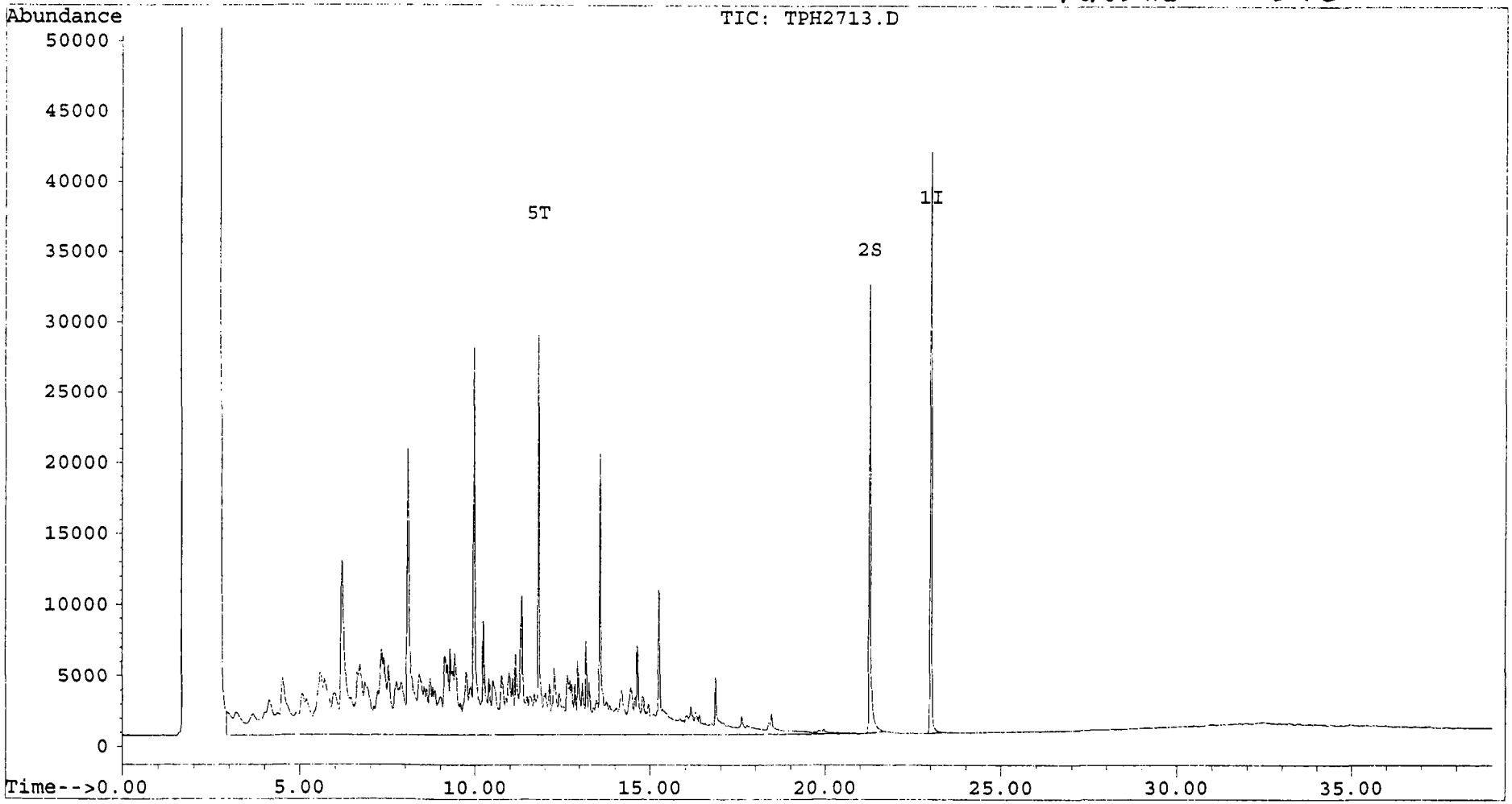
Data File : H:\HPCHEM\5\DATA\TPH1002\TPH2713.D
Acq On : 02 Oct 02 05:01 PM
Sample : Kerosene 1000ppm CC ME169W
Misc : 1 uL shot
Quant Time: Oct 2 17:49 19102

Vial: 8
Operator: Eric/Miles/Phil R.
Inst : 5890-1R
Multiplr: 1.00

Method : H:\HPCHEM\5\METHODS\TPHCC.M
Title : TPH By GC/FID (stds.)
Last Update : Wed May 15 19:45:40 2002
Response via : Multiple Level Calibration

Volume Inj. :
Signal Phase :
Signal Info :

kerosene standard



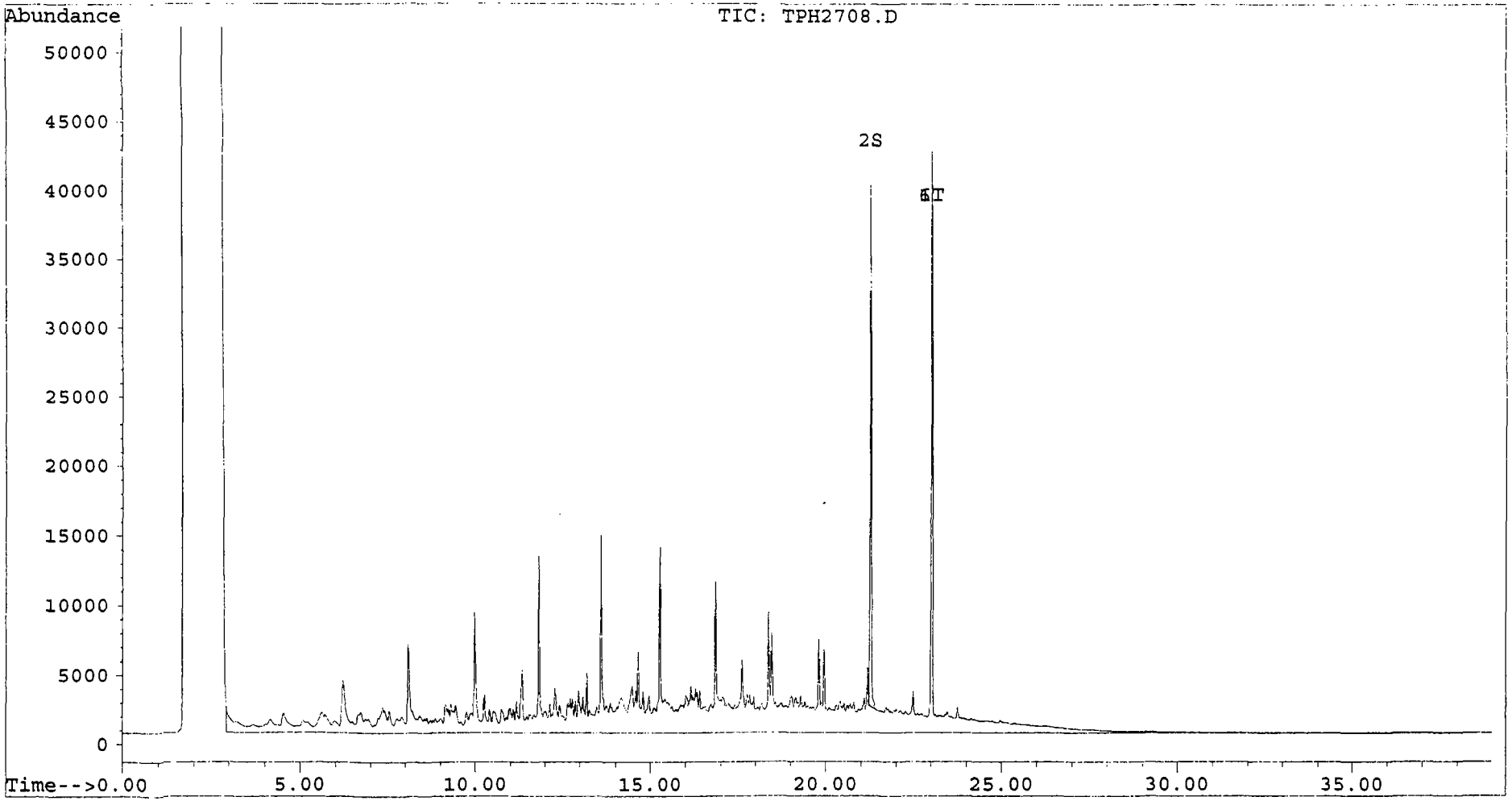
Data File : H:\HPCHEM\5\DATA\TPH1002\TPH2708.D
Acq On : 02 Oct 02 08:59 AM
Sample : Diesel #2 1000ppm CC ME166W
Misc : 1 uL shot
Quant Time: Oct 2 9:44 19102

Vial: 3
Operator: Eric/Miles/Phil R.
Inst : 5890-1R
Multiplr: 1.00

Method : H:\HPCHEM\5\METHODS\TPHCC.M
Title : TPH By GC/FID (stds.)
Last Update : Wed May 15 19:45:40 2002
Response via : Multiple Level Calibration

Volume Inj. :
Signal Phase :
Signal Info :

Diesel/#2 Fuel 0.1 Standard



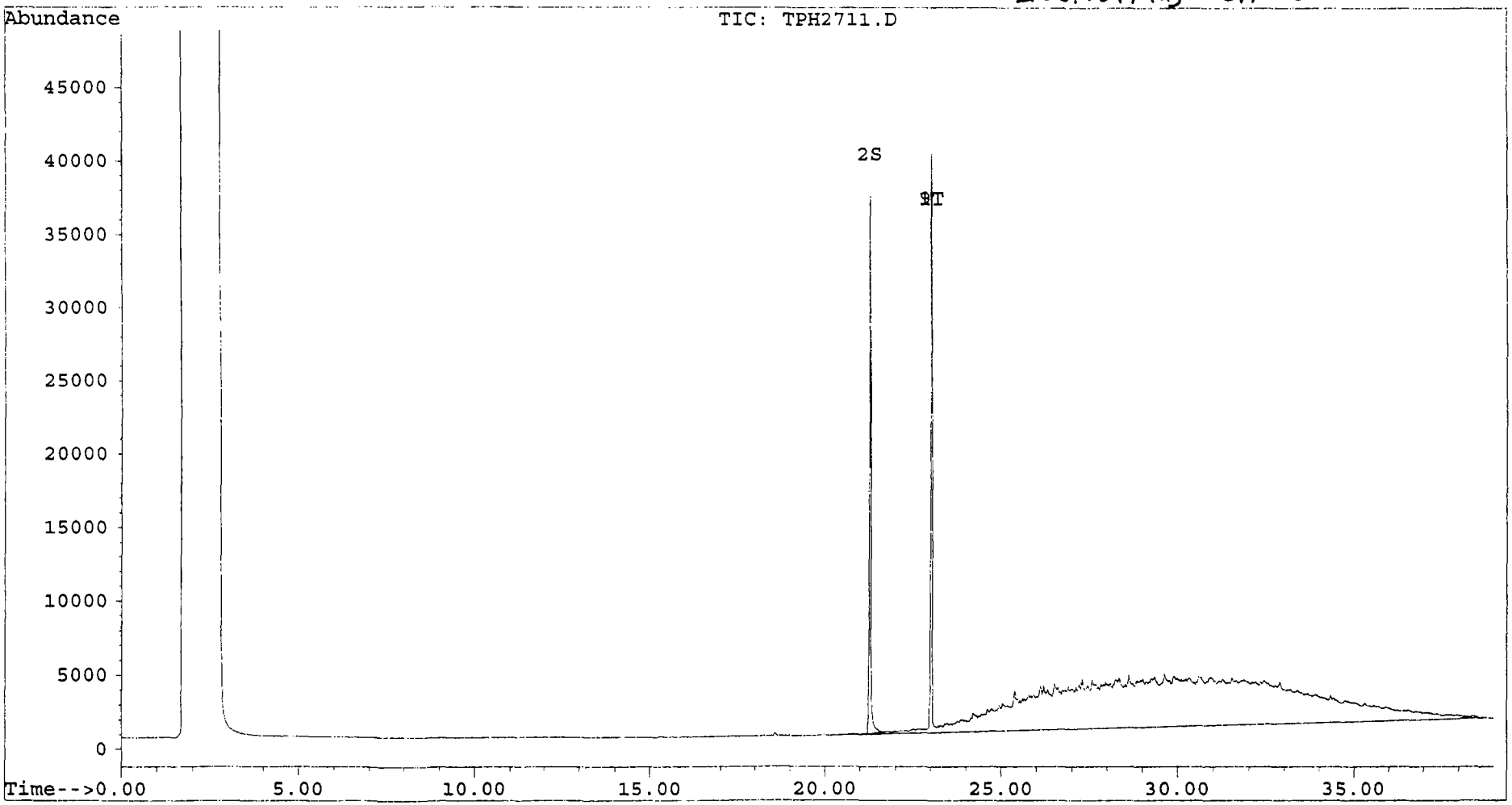
Data File : H:\HPCHEM\5\DATA\TPH1002\TPH2711.D
Acq On : 02 Oct 02 01:00 PM
Sample : Lubricating Oil 1000ppm CC ME170W
Misc : 1 uL shot
Quant Time: Oct 2 15:07 19102

Vial: 6
Operator: Eric/Miles/Phil R.
Inst : 5890-1R
Multiplr: 1.00

Method : H:\HPCHEM\5\METHODS\TPHCC.M
Title : TPH By GC/FID (stds.)
Last Update : Wed May 15 19:45:40 2002
Response via : Multiple Level Calibration

Volume Inj. :
Signal Phase :
Signal Info :

Lubricating oil standard



CleanHarbors

Clean Harbors Environmental Services, Inc. 1 Hill Ave., Braintree, MA 02184 | CHAIN OF CUSTODY RECORD | Sample Custodian - (781) 849-1800 | Page of

Client: ECTS Project Name: Murphys Oil Work Order/P.O. #: EN183186 Date: 9/30/00

Report To: Jay McCreary Address: 392 Libbey Industrial Pkwy Phone #: 781-849-1800 x8399

↑ will call w/

Sample I.D.	Sampling Information: Date	Time	Station Location	Sample Matrix	Analysis: TCLP VOA	TCLP BNA	TCLP METALS	PCBs	TPH by GC/FID*							# of con.	CHES Sample # (Pg 1 of 1) G0204064
MW-7	9/30	PM		Aq				X	X							2	01
MW-16	9/30	PM		Aq				X	X							2	02
									↑ w/ chromatograph								

	VOA Vial	Glass Bottle	Plastic Bottle	Pres.	Volume
		X	X	X	

Relinquished by Sampler: Lisa M Date: 9/30/00 Time: 6:05pm

Received by: Date: 10/1/00 Time: 7:00 am

Relinquished by: Date: Time:

Received by: Date: Time:

Preservation Key: A – Acidified with HCl
B – Filtered, C – Sample chilled, D – NaOH,
E – NaThiosulfate, W – Sample Ambient, F – Other

COMMENTS: (Fax Number, cautions, special instructions)

ON 01 ONLY
per J. McCreary

Standard laboratory turnaround time is 1 week from date of receipt. Accelerated turnaround may be assessed a surcharge.

Location of samples: fridge R642

Turnaround: 24 Hrs. 48 Hrs. 1 Week Other:

CHI 119

APP E

ENVIRONMENTAL SERVICES, INC.
1 HILL AVE., P.O. BOX 859048 • BRAINTREE, MA 02185-9048
(781) 849-1800 • FAX (781) 848-1955
Visit our Website at www.cleanharbors.com

Report of Analysis

Clean Harbors Environmental Services, Inc.
392 Libbey Industrial PWY
Weymouth, MA 02189

Project: Murphy's
P.O. #: EN183186

Date Received 10/14/2002
CHES Lab #: G0204108

Attn: Mr. Jay McCreery

Enclosed are the results for the sample(s) delivered to our laboratory (DEP Laboratory ID# M-MA032) on the date indicated above.

The methods listed represent those methodologies which were used to develop the best analytical techniques. Analytical results and quality assurance protocols are based on these guidelines. These meet the requirements for the reporting of results under the RCRA, NPDES and Safe Drinking Water Act regulations.

Clean Harbors Environmental Services has an active program of quality assurance and quality control. The program closely follows the guidance provided in the EPA Contract Laboratory Program Statement of Work (organic and inorganic), the guidance provided in SW-846, and many other pertinent documents.

Should you have any questions concerning this work, please do not hesitate to contact me.

The information contained in this report is, to the best of my knowledge, accurate and complete.

Per Date: Michael J. Murray 10/23/02
Michael J. Murray
Laboratory Director

CASE NARRATIVE

Clean Harbors Environmental Services Companies

Prepared for:

Clean Harbors Environmental Services, Inc.
392 Libbey Industrial PWY
Weymouth, MA 02189

ETR: G0204108

Project: Murphy's

The following samples were received as indicated below and on the attached Chain of Custody record. All analyses were performed within the holding time and with acceptable quality control results unless otherwise noted.

SAMPLE ID	LAB ID	MATRIX	Date Collected	Date Received
MW-7	0204108-01	LIQUID	10/11/2002	10/14/2002
MW-16	0204108-02	LIQUID	10/11/2002	10/14/2002

EPH and VPH analysis performed by Scilab Boston, Inc.

The enclosed results of analyses are representative of the samples as received by the laboratory. We make no representations or certifications as to the methods of sample collection, sample identification, or transportation handling procedures used prior to our receipt of samples. To the best of my knowledge, the information contained in this report is accurate and complete.

Approved By: Michael Murray Date: 10/28/02

Clean Harbors Environmental Services Companies

ANALYTICAL REPORT

Clean Harbors Environmental Services Companies

Clean Harbors Environmental Services,
392 Libbey Industrial PWY
Weymouth, MA 02189

Project: Murphy's

ETR: G0204108
LAB ID: 0204108-01
Method Blank: 0005943-01

8082 PCB as Aroclors

SAMPLE ID: MW-7

Date Received	Date Collected	Date Analyzed	Matrix	Units	Analyst
10/14/02	10/11/02	10/16/02	LIQUID	ug/l	MW

Parameter	Result	PQL
Aroclor 1016	ND	1.0
Aroclor 1221	ND	1.0
Aroclor 1232	ND	1.0
Aroclor 1242	ND	1.0
Aroclor 1248	ND	1.0
Aroclor 1254	ND	1.0
Aroclor 1260	ND	1.0

Compound	% Recovered	QC Limits (%)	
TCMX (surr)	104	54	125

DL = diluted out

ANALYTICAL REPORT

Clean Harbors Environmental Services Companies

Clean Harbors Environmental Services,
392 Libbey Industrial PWY
Weymouth, MA 02189

Project: Murphy's

ETR: G0204108
LAB ID: 0204108-02
Method Blank: 0005943-01

8082 PCB as Aroclors

SAMPLE ID: MW-16

Date Received	Date Collected	Date Analyzed	Matrix	Units	Analyst
10/14/02	10/11/02	10/16/02	LIQUID	ug/l	MW

Parameter	Result	PQL
Aroclor 1016	ND	1.0
Aroclor 1221	ND	1.0
Aroclor 1232	ND	1.0
Aroclor 1242	ND	1.0
Aroclor 1248	ND	1.0
Aroclor 1254	ND	1.0
Aroclor 1260	ND	1.0

Compound	% Recovered	QC Limits (%)	
TCMX (surr)	105	54	125

DL = diluted out

SCILAB

Eight School Street
Weymouth, MA 02189
781-337-9334

Laboratory Report

Report Date 10/22/2002
Workorder No. 0210-00194

Customer: Clean Harbors
1 Hill Avenue
Braintree, MA 02184

Attention: Mr. Michael Murray
Subject: MURPHY'S: EPH/VPH WATERS

Sample: 001 MW-7: G0204018-01
Date: 00/00/0000
Matrix: WATER

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Volatile Petroleum Hydro.					LKD	10/18/2002	
C5-C8 Aliphatics	MADEP VPH	ND	ug/L	30	LKD	10/18/2002	
C9-C12 Aliphatics	MADEP VPH	ND	ug/L	30	LKD	10/18/2002	
C9-C10 Aromatics	MADEP VPH	ND	ug/L	30	LKD	10/18/2002	
Methy Tert Butyl Ether	MADEP VPH	ND	ug/L	1	LKD	10/18/2002	
Benzene	MADEP VPH	ND	ug/L	2	LKD	10/18/2002	
Toluene	MADEP VPH	ND	ug/L	1	LKD	10/18/2002	
Ethylbenzene	MADEP VPH	ND	ug/L	1	LKD	10/18/2002	
M & P XYLENE	MADEP VPH	ND	ug/L	2	LKD	10/18/2002	
O-Xylene	MADEP VPH	ND	ug/L	1	LKD	10/18/2002	
Naphthalene	MADEP VPH	ND	ug/L	2	LKD	10/18/2002	
BFB SURR (FID)	MADEP VPH	119	%		LKD	10/18/2002	
BFB SURR (PID)	MADEP VPH	100	%		LKD	10/18/2002	
Extractable Petroleum Hydro					SKH	10/22/2020	
C9-C18 Aliphatics	EPH	56.0	ug/L	30.0	SKH	10/22/2020	
C19-C36 Aliphatics	EPH	562	ug/L	45.0	SKH	10/22/2020	
COD (SURROGATE)		64.4	%		SKH	10/22/2020	
C11-C22 Aromatics	EPH	ND	ug/L	85.0	SKH	10/22/2020	
Naphthalene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
2-Methyl Naphthalene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Acenaphthylene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Acenaphthene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Fluorene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Phenanthrene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Anthracene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Fluoranthene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Pyrene	EPH	ND	ug/L	1.0	SKH	10/22/2020	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 59744

SCILAB

Customer: Clean Harbors

Workorder No. 0210-00194

Sample: 001 **MW-7: G0204018-01**
(Continued)

Parameter	Method	Results	Units	PQL	Analyst	Analysis Date	Qual
Benzo (a) Anthracene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Chrysene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Benzo (b) Flouranthene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Benzo (k) Flouranthene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Benzo (a) Pyrene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Indeno (1,2,3-cd) Pyrene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Dibenzo (a,h) Anthracene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
Benzo (g,h,i) Perylene	EPH	ND	ug/L	1.0	SKH	10/22/2020	
OTP (SURROGATE)		61.1	%		SKH	10/22/2020	
2-Fluorobiphenyl (SURR)		56.0	%		SKH	10/22/2020	
2-Bromonephthalene (SURR		42.6	%		SKH	10/22/2020	
EPH Extraction	MADEP EPH	1.0			NAM	10/18/2002	

Sample: 002 **MW-16: G0204018-02**
Date: 00/00/0000
Matrix: WATER

Parameter	Method	Results (GW-1)	Units	PQL	Analyst	Analysis Date	Qual
Volatile Petroleum Hydro.					LKD	10/21/2002	
C5-C8 Aliphatics	MADEP VPH	1437.735 (400)	ug/L	30	LKD	10/21/2002	
C9-C12 Aliphatics	MADEP VPH	418.747 (4000)	ug/L	30	LKD	10/21/2002	
C9-C10 Aromatics	MADEP VPH	106.463 (4000)	ug/L	30	LKD	10/21/2002	
Methy Tert Butyl Ether	MADEP VPH	ND	ug/L	1	LKD	10/21/2002	
Benzene	MADEP VPH	26.1	ug/L	2	LKD	10/21/2002	
Toluene	MADEP VPH	5.34	ug/L	1	LKD	10/21/2002	
Ethylbenzene	MADEP VPH	5.46	ug/L	1	LKD	10/21/2002	
M & P XYLENE	MADEP VPH	13.8	ug/L	2	LKD	10/21/2002	
O-Xylene	MADEP VPH	9.60	ug/L	1	LKD	10/21/2002	
Naphthalene	MADEP VPH	7.22	ug/L	2	LKD	10/21/2002	
BFB SURR (FID)	MADEP VPH	117	%		LKD	10/21/2002	
BFB SURR (PID)	MADEP VPH	94.3	%		LKD	10/21/2002	
Extractable Petroleum Hydro					SKH	10/22/2020	
C9-C18 Aliphatics	EPH	903	ug/L	30.0	SKH	10/22/2020	
C19-C36 Aliphatics	EPH	10300 (2000)	ug/L	45.0	SKH	10/22/2020	E
COD (SURROGATE)		56.3	%		SKH	10/22/2020	
C11-C22 Aromatics	EPH	2500	ug/L	85.0	SKH	10/22/2020	

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 59744

SCILAB

Customer: Clean Harbors

Workorder No. 0210-00194

Sample: 002 MW-16: G0204018-02
(Continued)

Parameter	Method	Results	Gw-1	Units	PQL	Analyst	Analysis Date	Qual
Naphthalene	EPH	5.44	20	ug/L	1.0	SKH	10/22/2020	
2-Methyl Naphthalene	EPH	6.15	10	ug/L	1.0	SKH	10/22/2020	
Acenaphthylene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Acenaphthene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Fluorene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Phenanthrene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Anthracene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Fluoranthene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Pyrene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Benzo (a) Anthracene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Chrysene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Benzo (b) Flouranthene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Benzo (k) Flouranthene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Benzo (a) Pyrene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Indeno (1,2,3-cd) Pyrene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Dibenzo (a,h) Anthracene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
Benzo (g,h,i) Perylene	EPH	ND		ug/L	1.0	SKH	10/22/2020	
OTP (SURROGATE)		58.2		%		SKH	10/22/2020	
2-Fluorobiphenyl (SURR)		55.6		%		SKH	10/22/2020	
2-Bromonaphthalene (SURR		54.2		%		SKH	10/22/2020	
EPH Extraction	MADEP EPH	1.0				NAM	10/18/2002	

To the best of my knowledge this report is true and accurate.

Authorized By:

John J. Sulkowski, Laboratory Director

Certifications: MA: MA069 NY:10982 CT: PH0119 RI:A45 CA:2050 NJ: 59744

CHAIN OF CUSTODY RECORD

WORK ORDER NO. 02.10.194

SCILAB BOSTON, INC.

8 School Street Weymouth, MA 02189-8951
781 337-9334 / FAX 781 337-7642

DUE DATE 10.18.02 (22)

COMPANY: CLEAN HARBORS
1 HILL AVE
BRAINTREE, MA ~~02~~ 02184
PHONE: (781) 849-1800 x3466 FAX #: (781) 848-1955
P.O.#: G020408
CLIENT CONTACT: MIKE MURRAY
PROJECT #: MURPHY'S

SAMPLE TYPE
1. WATER
2. SOIL
3. SLUDGE
4. OIL
5. CHIPS
6. WIPES
7. AIR CASSETTE
8. OTHER

CONTAINER TYPE
P - PLASTIC
G - GLASS
V - VOA

SCILAB SAMPLE #	CLIENT SAMPLE IDENTIFICATION	SAMPLE TYPE	CONTAINER SIZE	CONTAINER TYPE	CONTAINER #	SAMPLING INFORMATION DATE	TIME	TECH	PRESERVATIVES	VPH Deluxe	EPH Deluxe	SAMPLE pH at Login	
1	MW-7 G020401B-01	LIQ	40ml	VOA	1					X	X		3
2	MW-16 G020401B-02	LIQ	40ml	VOA	1					X	X		3

REPORT PACKAGES
- MWRA ☐
- MA DEP ☐
- RDR ☐
- ASP A ☐
- ASP B ☐
- QC LEVEL 1 ☐
- QC LEVEL 2 ☐

SAMPLED BY	DATE:	RECEIVED BY	DATE:	Temperature upon receipt 5°C
	TIME:		TIME:	
RELINQUISHED BY: Peter Pringle	DATE: 10-15-02	RECEIVED BY	DATE: 10/16	SPECIAL INSTRUCTIONS Std TAT
	TIME: 9:15 AM		TIME: 16:30	☐ 24 HOUR TAT ~~☒ 5 Day TAT~~
RELINQUISHED BY:	DATE:	RECEIVED BY	DATE:	☐ 48 HOUR TAT ☐ 7 DAY TAT
	TIME:		TIME:	~~☒ 72 HOUR TAT~~ ☐ 10 DAY TAT

Shade area for laboratory use only.
Gold copy - Originator Retains
Pink copy - Shipper Retains
Submit White and Yellow copies to the laboratory.

CleanHarbors

Clean Harbors Environmental Services, Inc. 1 Hill Ave., Braintree, MA 02184 | CHAIN OF CUSTODY RECORD | Sample Custodian - (781) 849-1800 | Page 1 of 1

Client: ECTS | Project Name: Murphy's | Work Order/P.O. #: EN183186 | Date: 10-11-02

Report To: Jay McCreery | Address: 392 Libbey | Phone #: ~~781-794~~ 781-849-1800 x8399

Sample I.D.	Sampling Information: Date	Time	Station Location	Sample Matrix	Analysis: TCLP VOA	TCLP BNA	TCLP METALS	PCBs	VPH	EPH						# of con.	CHES Sample #
																	10/14/0 0204108
MW-7	10/11	AM		Aqueous				X	X	X						4	-01
MW-16	↓	↓		↓				X	X	X						4	-02

	VOA Vial	Glass Bottle	Plastic Bottle	Pres.	Volume
		4			
		2	1	2	
		None	HCl	HCl	
		1	1	40ml	

Relinquished by Sampler: Susan M. Lee
Date: 10-11-02 Time: 4:20 pm

Received by:
Date: Time:

Relinquished by:
Date: Time:

Received by: Robin Pringle
Date: 10-14-02 Time: 7:30 AM

Preservation Key: A – Acidified with HCl
B – Filtered, C – Sample chilled, D – NaOH,
E – NaThiosulfate, W – Sample Ambient, F – Other

COMMENTS: (Fax Number, cautions, special instructions)

R6L4

Standard laboratory turnaround time is 1 week from date of receipt. Accelerated turnaround may be assessed a surcharge.

Location of samples: Fridge

Turnaround: 24 Hrs. 48 Hrs. (1 Week) Other:

CHI 119

OFFICE COPY

APP. F

PETROPORE ™

Operations Manual for Model 300M Self-Bailer Filter

PJ Products Co., Scituate, MA 02066

TABLE OF CONTENTS

1. DESCRIPTION AND PRINCIPLES OF OPERATION

The Model 300M PETROPORE filter system offers an economical method of extracting free-floating liquid hydrocarbons (e.g., gasoline, diesel and jet fuels, and home heating oil) found in contaminated groundwater monitoring or recovery wells.

Internally, the Model 300M PETROPORE filter consists of a filter section and collection reservoir housed in a flotation shell (Figure 1). When initially lowered into a recovery well, the Model 300M PETROPORE filter partially submerges, placing the reservoir section slightly below the waterline.

As the Model 300M PETROPORE filter collects hydrocarbon products in its reservoir section, the weight of the collected product lowers the flotation plane, exposing fresh filter surface.

2. INSTALLATION

Refer to Figure 1 for component identification. Prior to placing the Model 300M PETROPORE filter in a 2-inch or larger diameter recovery well, verify that the lowering lanyard's captive end is attached to the filter assembly.

Adjust the Model 300M PETROPORE filter's slide valve to cover the two 10-32 threaded holes in the unit's top. Make sure that the slide valve's vent hole is positioned over one of the threaded holes. The arrow end of the slide valve should be pointed at the black dot on the unit's top.

Gently lower the Model 300M PETROPORE filter into the recovery well. When the unit freely floats on the groundwater, adjust the lowering lanyard to provide 6 to 8 inches of slack and secure the lanyard's free end to the well cap or casing.

3. COLLECTED-PRODUCT RECOVERY

The rate at which the Model 300M PETROPORE filter recovers hydrocarbon products varies with product type and product layer thickness. The Model 300M PETROPORE filter's recovered-product reservoir can accommodate up to 300 milliliters of liquid hydrocarbons.

Under typical test conditions, the Model 300M PETROPORE filter collects approximately 1.2 milliliters per minute for each 0.1 inch of product-layer thickness.

Thus, to determine the interval between product-removal bailings, calculate the hydrocarbon intake-per-minute rate by multiplying the collection rate and the layer thickness. Divide the reservoir capacity by the intake-per-minute value to calculate the time between bailings.

For example, exposure to a 0.1 inch hydrocarbon layer will fill the Model 300M PETROPORE filter's reservoir to capacity in approximately 100 minutes:

(1.2 ml/minute/0.1 inch collection rate) X (0.1 inch layer thickness) = 1.2ml/minute filter intake.

(300 ml capacity) / (1.2 ml/minute filter intake) = 250 minutes to reach reservoir capacity.

To recover the collected hydrocarbon products, raise the Model 300M PETROPORE filter by its attached lanyard. Turn the slide valve to uncover both of the 10-32 threaded holes in the unit's top. Tilt the assembly and empty the collected product via the holes into a collection container.

4. MAINTENANCE

To backflush the Model 300M PETROPORE filter, install a 10-32 threaded pipe plug into one of the 10-32 tapped holes in the unit's top plate. Connect the remaining hole via an air line to a source of pressure-regulated compressed air at a pressure of 20 to 30 pounds per square inch (p.s.i.) and apply air pressure.

Disconnect the air supply and remove the pipe plug. Remove the Model 300M PETROPORE filter's bottom plate and wash the reservoir's inner surface with hot, soapy water. Flush with clean water and reassemble.

NOTE: Prior to reinstalling the PETROPORE *after cleaning or removal from active use for more than 12 hours, soak the assembly for approximately 30 minutes in clean water to "wet" the filter element. Otherwise, the* PETROPORE *will absorb excess ground water and operate inefficiently.*

5. SPECIFICATIONS

Diameter: 1.7 inches (suitable for 2-inch or larger diameter recovery wells)

Length: 22.5 inches

Recovery Rate: 1.2 milliliters per minute per 0.1 inch of product-layer thickness

Filter Section: Proprietary oleophilic (hydrocarbon-absorbing) material

Reservoir Body: Delrin (Acetal)

Top Plate and Lanyard Attachment: Engineering plastic

Clamps: Type 304 stainless steel

Removable Bottom Plate: Type 304 stainless steel

Slide Valve: Type 304 stainless steel

O-Ring: VITON

Lanyard: 1/8-inch diameter, 12-foot braided nylon line.

Fittings: Tapped - 10-32

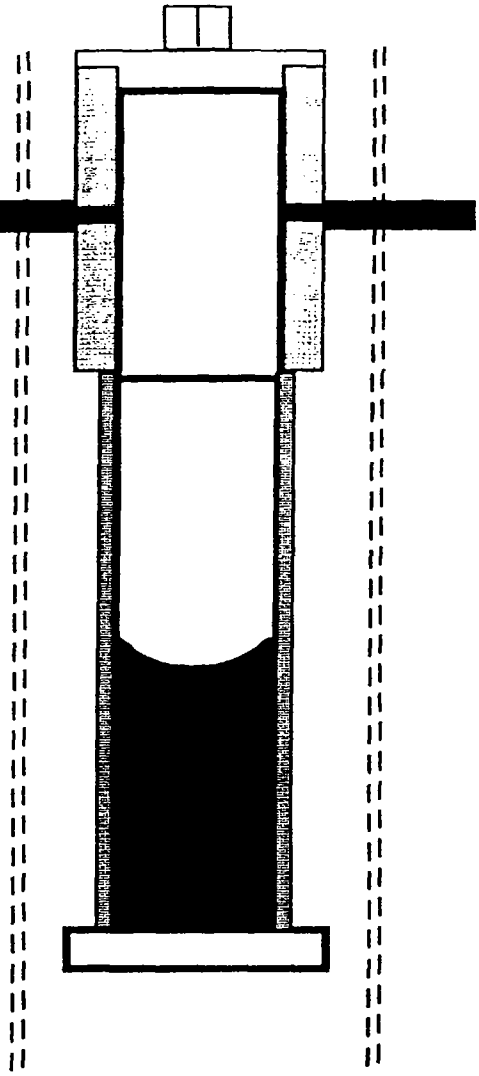
Trouble Shooting Guide:
Manual PetroPore™ System

Problem	Probable Cause	Solution
Water being collected with or without liquid hydrocarbon	PetroPore™ is sinking too far below top of unit.	Empty the fluid contents in the PetroPore™, drop back into the recovery well until unit floats, then tie off the lanyard line with 4 to 5 inches of slack.
	Bottom plate, reservoir not threaded tightly together.	After verifying that "O" rings are in place, hand tighten the assembly.
	Unit has been used to collect product, then taken out of service allowing membrane to dry out, thus opening the membrane pores.	Expose the membrane with product until completely wicked, It will then regain its original oil, water affinity and rejection properties respectively.
Product in recovery well but unit not recovering product.	Unit must be able to vent through hole in top plate.	Position slide valve arrow to dot on top plate.
	Unit's membrane is clogged.	Flush the unit by soaking in gasoline.

Note: PetroPore™ and "Unit" are used interchangeably

PETROPORE™

A LIQUID HYDROCARBON RECOVERY SYSTEM FOR COLLECTION OF FREE PRODUCT FLOATING ON THE GROUNDWATER



FEATURES:

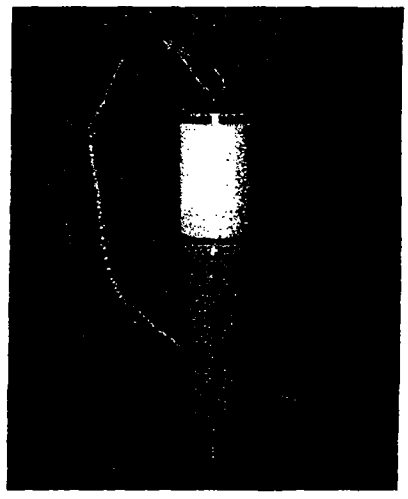
- NO MOVING PARTS IN THE BASIC SYSTEM
- FLOATS - NOT AFFECTED BY GROUND WATER FLUCTUATIONS
- PASSIVE OPERATION
- REJECTS WATER
- GREATLY REDUCES HYDROCARBON-INDUCED SOIL SMEARING
- MANUAL OR AUTOMATIC OPERATION

TYPICAL RECOVERY RATES:

FOR BOTH MODELS AS MEASURED IN A 4" PIPE WITH FLOATING GASOLINE LAYER

MODEL NO.	DIA.	RATE
+ 300	1.7 inches	1 ml/min. per .1 inch of product
+ 750	2.8 inches	>2 ml/min. per .1 inch of product

NOTE: MODEL NUMBER CORRESPONDS TO RESERVOIR HOLDING CAPACITY IN MILLILITERS



MODEL 750 Equipped for air ejection
(Shown at Right)

+ Can be automated

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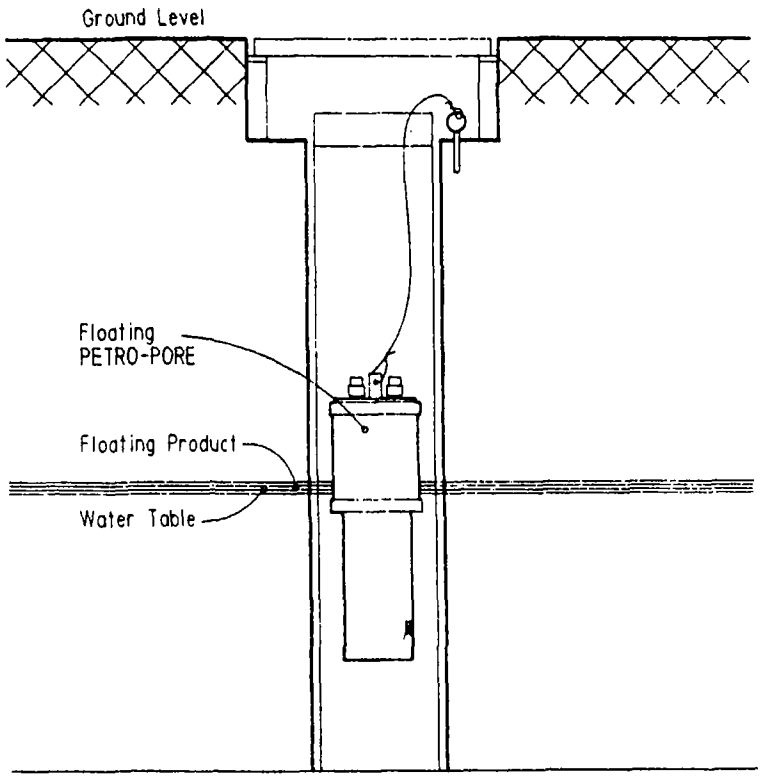
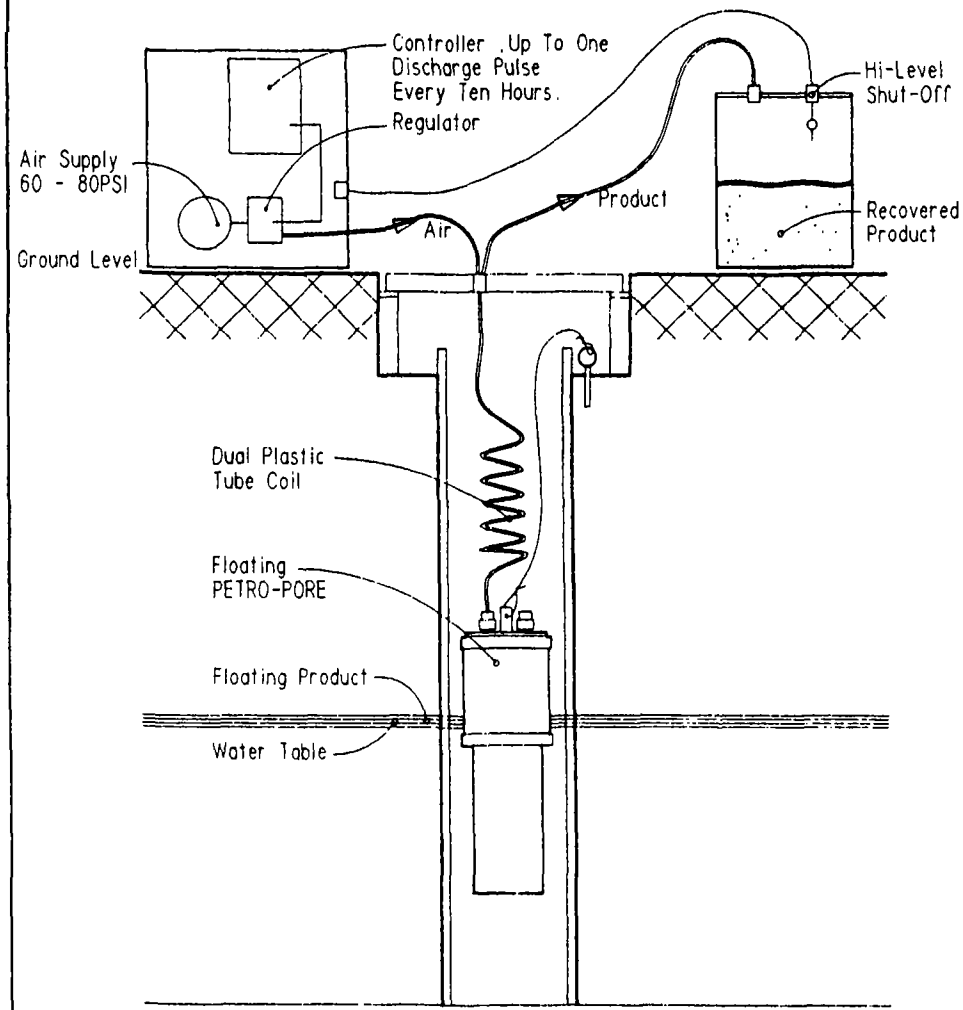
Typical systems on reverse side



BASIC SYSTEM
Product Removed From PETRO-PORE
By Raising And Pouring
Out Manually.

Figure 1

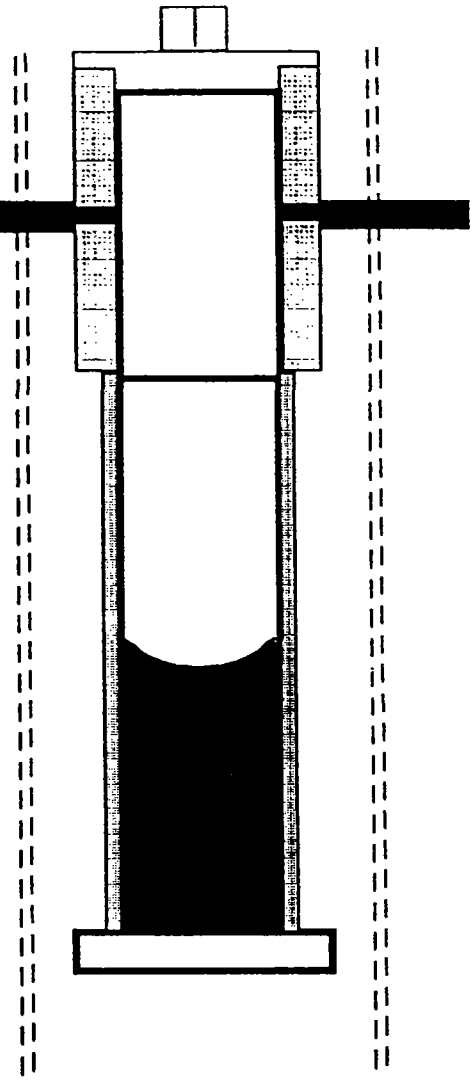


AUTOMATIC SYSTEM
Product Removed From PETRO-PORE
By Air Injection.

Figure 2

PETROPORE™

A LIQUID HYDROCARBON RECOVERY SYSTEM FOR COLLECTION OF FREE PRODUCT FLOATING ON THE GROUNDWATER



FEATURES:

- NO MOVING PARTS IN THE BASIC SYSTEM
- FLOATS - NOT AFFECTED BY GROUND WATER FLUCTUATIONS
- PASSIVE OPERATION
- REJECTS WATER
- GREATLY REDUCES HYDROCARBON-INDUCED SOIL SMEARING
- MANUAL OR AUTOMATIC OPERATION

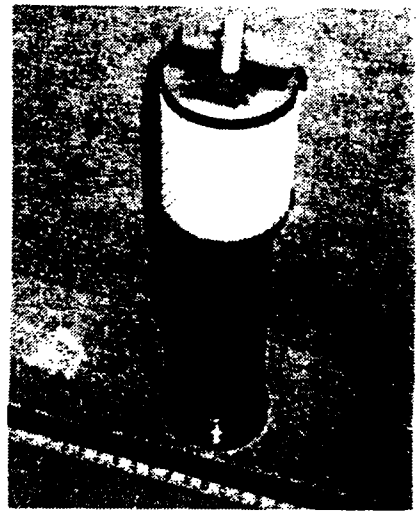
TYPICAL RECOVERY RATES:

FOR BOTH MODELS AS MEASURED IN A 4" PIPE WITH FLOATING GASOLINE LAYER

MODEL NO.	DIA.	RATE
+ 250	2.5 inches	>2 ml/min. per .1 inch of product
+ 300	1.7 inches	1 ml/min. per .1 inch of product
+ 750	2.8 inches	>2 ml/min. per .1 inch of product

NOTE: MODEL NUMBER CORRESPONDS TO RESERVOIR HOLDING CAPACITY IN MILLILITERS

+ Can be automated



MODEL 250
(Shown at Right)

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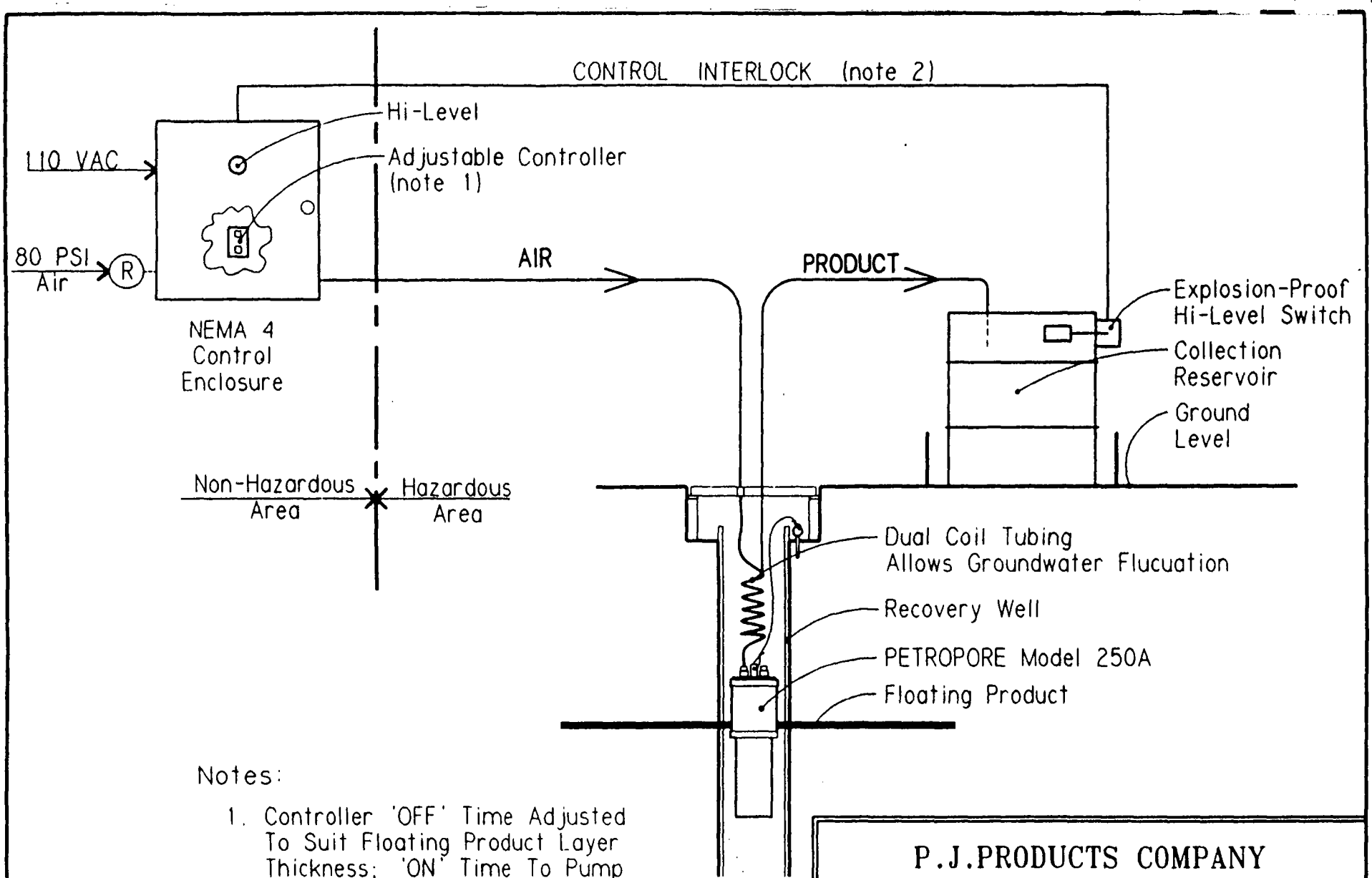
Typical systems on reverse side



Notes:

1. Controller 'OFF' Time Adjusted To Suit Floating Product Layer Thickness; 'ON' Time To Pump PETROPORE Contents Into Collection Reservoir Less Than One Minute.
2. Hi-Level Switch Stops Pump Cycle When Activated.

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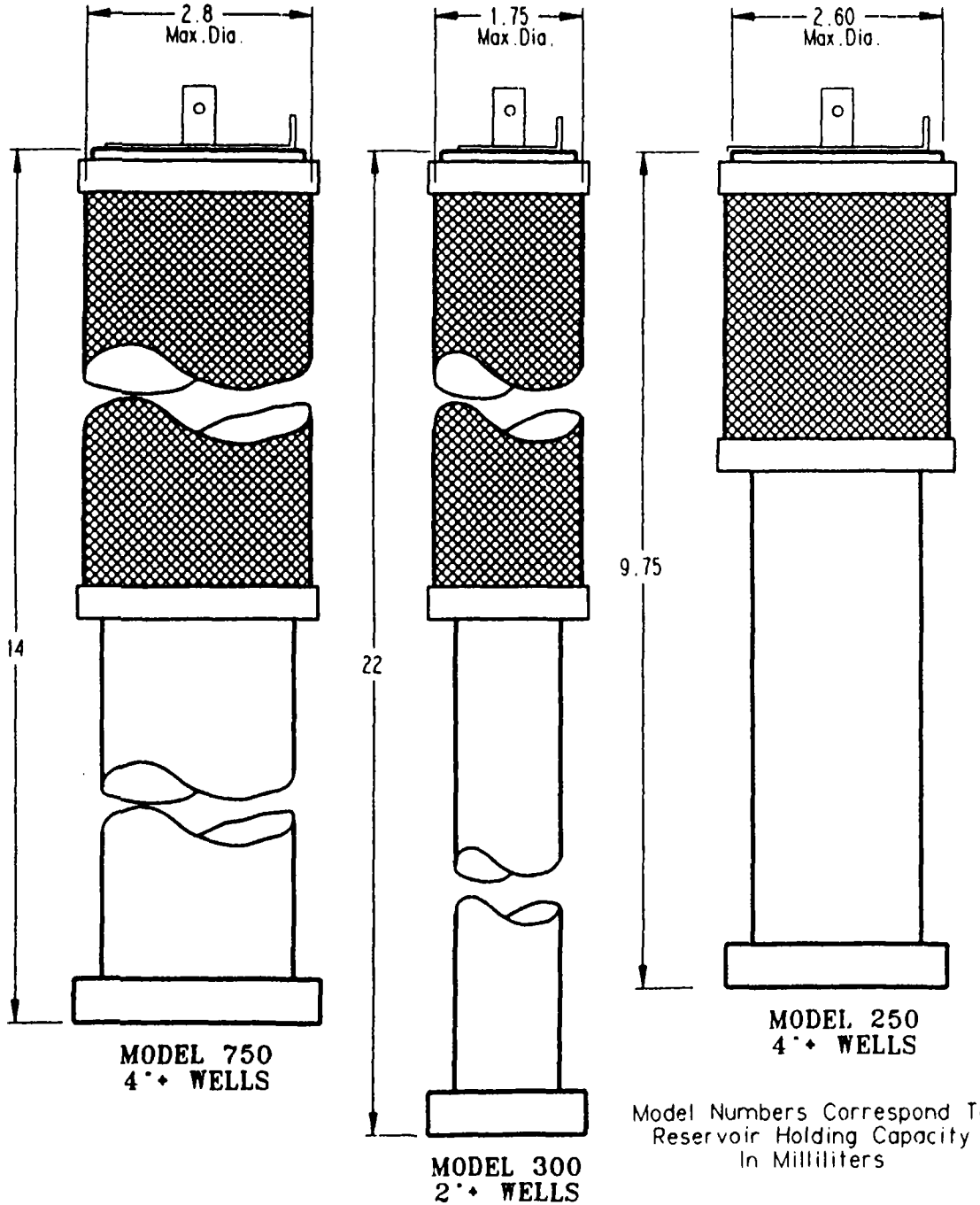
BLOCK DIAGRAM AUTOMATED PETROPORE HYDROCARBON RECOVERY SYSTEM - AIR EJECTION



Model Numbers Correspond To Reservoir Holding Capacity In Milliliters

Dimensions Are In Inches.

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Title

PETROPORE OUTLINES

Size	Drawn By	Checked	Model	Issue
A	db			-
	Date 9-5-96	Date		

Scale	Wt.	Sheet	Dwg No
1/2 scale	-		-

Cutting the High Cost of Free Product Removal

Three Cheers for Free Product Removal

by June Taylor

Recovery of free product is always influenced by soil conditions at a site, but free-product filters promise to remove at least as much product as traditional pump and treat methods.

ANYONE INVOLVED IN LUST cleanup work knows that removing free product, petroleum floating on groundwater, is very expensive. But, take heart! A new application for tried and true hydrophobic oil-water separating filters has hit the market and promises to provide a faster, cheaper, and more effective way to deal with free product removal at many LUST sites.

Imagine this situation: You are in charge of an underground petroleum cleanup. Ten thousand gallons of gasoline have been released and a foot of free product is floating on the groundwater. Here are two possible cleanup strategies for getting at that product. Choose the one you like best.

Strategy 1: *Traditional*

You drill a product recovery well (or 2 or 3, or more) and begin pumping. You pump up small amounts of free product along with oodles of contaminated water. Next, you run this contaminated broth through an oil-water separator to get some of the petroleum separated from the water. This exercise yields only a small percent of recovered petroleum. In fact, it is not unusual to pump up 10 or 100 times more groundwater than contaminant. So getting at those 10,000 gallons of "free" product and dealing with the tons of discharge water is an expensive proposition. After all, the pumped up water is contaminated and must be disposed of "properly". To do this, you have a couple of choices:

- Apply for a National Pollutant Discharge Elimination System (NPDES) permit so that the water can be discharged into a nearby stream, river, or dry arroyo. The NPDES process is time consuming and expensive, taking 1 to 3 months or more and costing $1,000 to $2,000. Also, the permit may require additional water treatment, such as carbon absorption, prior to discharge.
- Convince your local sewer authority to allow discharge of the contaminated water into the sewer system. Of course, if discharge is allowed, there will be a charge ($10-20 per 1,000 gallons) for the privilege.
- Accumulate the dirty water and haul it off to a private treatment facility. Again, it costs.

A related issue associated with this strategy is that by pumping out so much groundwater the water table is artificially lowered, smearing the floating product in and around more of the subsoil as it descends, a process hydrogeologists call "smearing" the aquifer. Smearing ultimately creates more pollution problem because, when it rains, the wate table rises again an groundwater is exposed to greater surface area of petroleu contaminated soil-contaminatin more groundwater faster.

Strategy 2: *Innovative*

Install free-product filters in yo monitoring wells and retrie 90-95% pure free product that ca be reused or recycle Free-product filters are be known for their use in t cleanup of oil spills in the ocea rivers, and lakes to separate an recover the floating produc That technology has now bee adapted for use in monitoring product recovery wells.

There are two kinds free-product filtering system one for small amounts of produ and one for large amounts. F sites with low flow or sm amounts of free product, t systems generally us a filt wrapped canister that floats the groundwater in the well. T canisters hold one or two gallo and are pulled up much like bailer and emptied. Where the are larger volumes of product, tube is dropped down to t canister so that the product c be pumped, rather than manua emptied. The canister/filter un are designed to fit in wells small as 2 inches; costs ran from about $400 to $1,000 well.

The hydrophobic filters used in both applications work because water molecules have a high surface tension which allows them to bond together like raindrops on a waxed car. Hydrocarbon molecules do not, so they slide through the filter pores. Filters may need to be cleaned or replaced periodically, but this is relatively inexpensive.

Petroleum naturally accumulates in monitoring wells to a point where it is three or more times greater than the product's thickness on the water table. Free-product filters take advantage of this phenomenon by slowly removing the accumulation. The systems are passive and don't artificially lower the water table, which eliminates the problem of contaminant smearing.

Free-product filters lower the cost of recovering product and they are speedy to implement-you don't need engineering designs which are time consuming and you don't need any permits. Major oil companies with a view to protecting themselves against liabilities see this as a big advantage. Peg Chandler, a geologists who leads British Petroleum's assessment and remediation group in the Midwest notes, "Whenever we get a call telling us there is free product at a site, we immediately classify the site as 'Priority 1', and we want to mitigate right away."

Chandler, who learned about the filters only last fall says, "They're great! We've used dozens already." In addition to the speed in starting cleanups, she finds that the filters reduce labor costs, especially where there is a small amount of product being recovered. "You just send someone out once every week or two to empty the canister. It couldn't be simpler."

Mark Erickson of Superior Environmental Services in Brighton, Michigan has used filter canisters over the past year at over a dozen sites. While he's had some problem with water entering the canister when contamination is down to a sheen, he's enthusiastic about the product. "We've removed from 10 to 100 gallons at different sites. We've been able to remove all free product that we're aware of in 6 months to a year. In many locations it's a big improvement over past options."

Tom Schruben, the EPA Office of Underground Storage Tank's lead person on LUST cleanups, likes filters because they solve the free-product emergency problem without contributing to future groundwater problems (the smearing situation). Cheers Schruben, "You recover more of the product than with a traditional pumping system, it's faster, cheaper, and you can do it yourself!"

Free product removal is only one aspect of a cleanup, but it is important. (An immediate concern of emergency personnel is keeping product and vapors out of nearby basements.) Recovery of free product is always influenced by soil conditions at a site, but free-product filters promise to remove at least as much product as traditional pump and treat methods. The fact that they achieve this at lower cost without worsening subsurface contamination is something to cheer about. ■

Partial reprint of an article from LUST Line Bulletin 16 March, 1992 Published by New England Interstate Water Pollution Control Commission, Boston, MA